SAWPA Comments to Vol 1 of 2013 Update

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Sent: Monday, November 18, 2013 11:53 PM
To: DWR CWP Comments
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Attachments: Vol1_Ch00_ExecSummary_SAWP~1.pdf (1 MB)

Hello:

We are sending comments to 5 sections of the CWP 2013 Update Volume 1: the Executive Summary, Chapter 1, Chapter 4, Chapter 7 and Chapter 8. Most of the comments are to the Executive Summary section. I will send the chapters in separate emails as they are large files.

Comments were made using the Adobe Reader sticky notes as suggested.

Thanks,

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Executive Summary

The California Water Plan: Investment in Innovation and Infrastructure

California water managers and elected officials are responsible for ensuring reliable and clean water supplies for a growing population, reducing flood risks to ensure public safety, and enhancing and restoring the state's ecosystems, all while safeguarding California's economy. These responsibilities exist at a time when the demands placed on natural resource-based assets and services are increasing and while funding for resource management is more and more limited. This necessitates doing more with less.

As mandated in the California Water Code, the California Water Plan (CWP) is the State's long-term strategic plan for guiding the management and development of water resources under these emerging conditions and expectations, and in the face of an uncertain future. *California Water Plan Update 2013* (Update 2013) provides a strategic vision and roadmap for California's water future that is informed and supported by hundreds of stakeholders; dozens of federal, State, and tribal entities; and nearly 40 other companion plans developed by myriad State agencies.

California Water Plan Vision

California has healthy, resilient watersheds and reliable and secure water resources and management systems. Public health, safety, and quality of life in rural, suburban, and urban communities are significantly improved as a result of advancements in integrated water management. The water system provides the certainty needed for quality of life, sustainable economic growth, business vitality, and agricultural productivity. California's unique biological diversity, ecological values, and cultural heritage are protected and have substantially recovered.

Update 2013 does not create mandates, prioritize actions, or allocate funding. Instead, it provides a roadmap that informs legislative action, as well as planning and decision-making, at all levels of government. It characterizes water resource conditions in the state today, describes the factors that are driving change, recognizes challenges and impediments to effective solutions, and lays out a comprehensive suite of potential future actions intended to move California toward more sustainable management of water resources and more resilient water management systems. Ultimately, sustainability and resiliency need to be measured in terms of improved public safety (societal benefits), environmental stewardship (environmental benefits), and economic stability (financial benefits).

- Reduce flood risk Statewide.
- Provide safe drinking water.
- Improve water quality for fisheries and recreation.

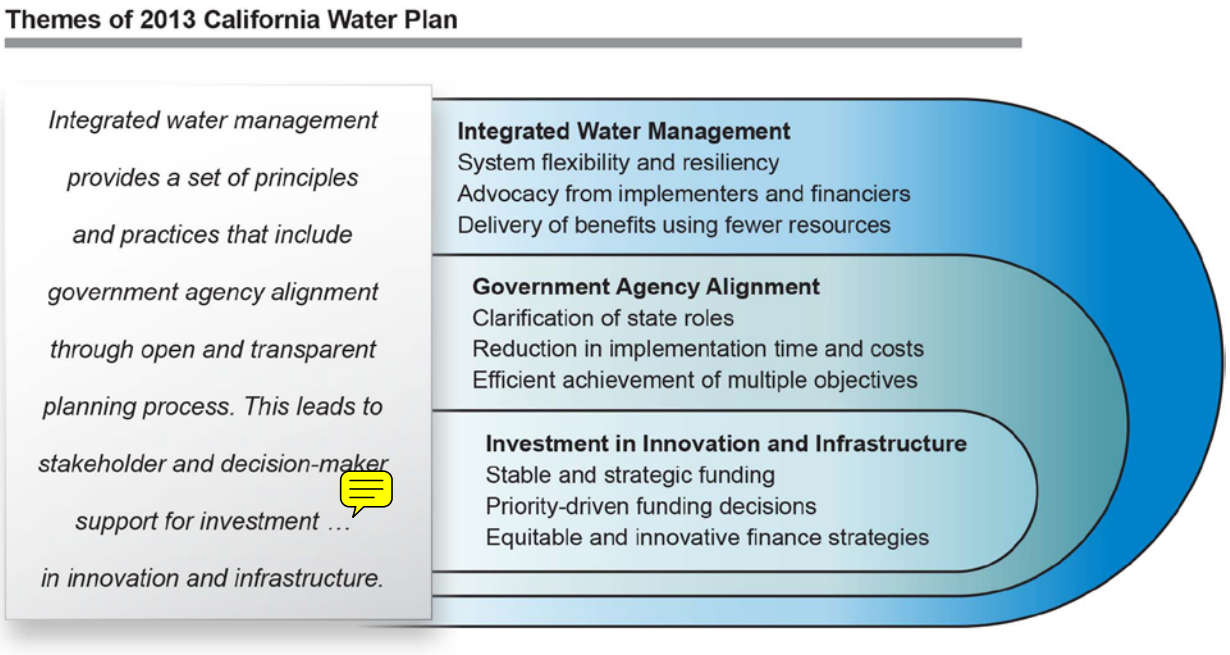
- Enhance Bay-Delta ecosystem.
- Restore terrestrial and aquatic habitats.
- Improve watershed management.
- Raise awareness and increase stewardship.

- Enhance State economic output.
- Contribute to job creation and security.
- Promote food production security.
- Provide stable funding for infrastructure.

A Call for Action: Integration, Alignment, and Investment

Despite significant investments made in management and improvement of the state's natural and human-made water resource infrastructure over the past few decades, Californians today face rising and unacceptable risks from flooding, water shortages, unhealthy water quality, and ecosystem degradation. These challenges will only intensify in the future without bold action backed by stakeholder support. Many of California's ecosystems and much of our water supply and flood protection infrastructure are no longer functioning properly or have exceeded their life cycles. For example, many communities depend on aging water supply and flood management infrastructure badly in need of maintenance or replacement; many essential species and ecosystems are rapidly declining; and some Californians do not have access to safe, clean drinking water. To compound the situation, such stressors as climate change, earthquakes, and lack of stable funding further threaten the integrity and reliability of the state's water supply, flood protection, and environmental systems.

Update 2013's strategies and actions promote three the to address the challenges facing California today: 1) advance integrated water management (IWM); 2) strengthen government agency alignment; and 3) invest in innovation and infrastructure. The themes are interconnected and work together.



Advance Integrated Water Management

With Update 2013, the State is renewing its commitment to IWM. IWM is a strategic approach to planning and implementing water management programs that combines flood management, environmental stewardship, and water supply actions to deliver multiple economic, environmental, and social benefits across watershed and jurisdictional boundaries. The IWM approach provides a set of principles and practices that strengthen government agency alignment and efficiencies through collaborative and transparent planning. This in turn promotes stakeholder and decision-maker support for cost-effective investments in multi-benefit projects and more diversified water portfolios. This support provides increased advocacy, as well as a greater number and variety of potential implementers and

financiers. The result is more efficient, effective, and regionally appropriate water resource planning and management that leads to higher returns on investment; actions with more sustainable outcomes; and greater water system resiliency and adaptability to future challenges, such as growth and climate change.

The previous updates to the CWP introduced IWM as an effective approach to achieving more sustainable management of the state's water resources. Update 2013 represents an important next step in advancing IWM by articulating the outcomes or types of benefits of greatest value to stakeholders, and further clarifying and defining the scope and focus of IWM as an outcome-based approach. Desired outcomes include improved system flexibility and resiliency; increased advocacy for multi-beneficiary projects from potential implementers and financiers; and delivery of benefits at a faster pace, using fewer resources than are typically required to implement single-benefit projects. IWM and integrated regional water management (IRWM) practices have made strides over the past 12 years, and Update 2013 encourages the expansion and enhancement of these practices.

Strengthen Government Agency Alignment

California has a wide variety of climates, landforms, and institutions, as well as a diverse, place-based range of cultures, which can be described as *anthrodiversity* (e.g., the human aspect of biodiversity that denotes the value of sustaining varied human habitats, such as rural, suburban, and urban communities). For example, there are more than 2,300 public resource management agencies at four primary levels of government (federal, State, regional, and local). Californians' disparate priorities, beliefs, practices, and resource consumption rates define and support California's rich social diversity. The most effective and efficient solu are an amalgam of diverse input and data from a large variety of elected officials, opinion leaders, stakeholders, scientists, and subject experts. These circumstances necessitate that data management, planning, policy-making, and regulation occur in a more collaborative, regionally appropriate manner. Sustainable outcomes will rely on a blend of subject expertise and perspectives woven together into comprehensive place-based and regionally appropriate policies and projects.

Discussions regarding water management priorities, including how they should be funded, often devolve into conflict, often with stakeholders or decision-makers operating from different sets of information prepared for disparate purposes. In most cases, the information is accurate but can be incomplete, drawn out of context, or based on fundamentally different assumptions. The outreach and collaboration process of Update 2013 has attempted to translate these different perspectives into practical information to enable decision-making and expedite implementation. For example, the future scenarios described in Chapter 5, "Managing an Uncertain Future," provide a framework for making common assumptions and applying analytical tools to align understanding of possible future water conditions across diverse stakeholder interests. This type of collaborative planning has yielded well-supported, implementable recommendations.

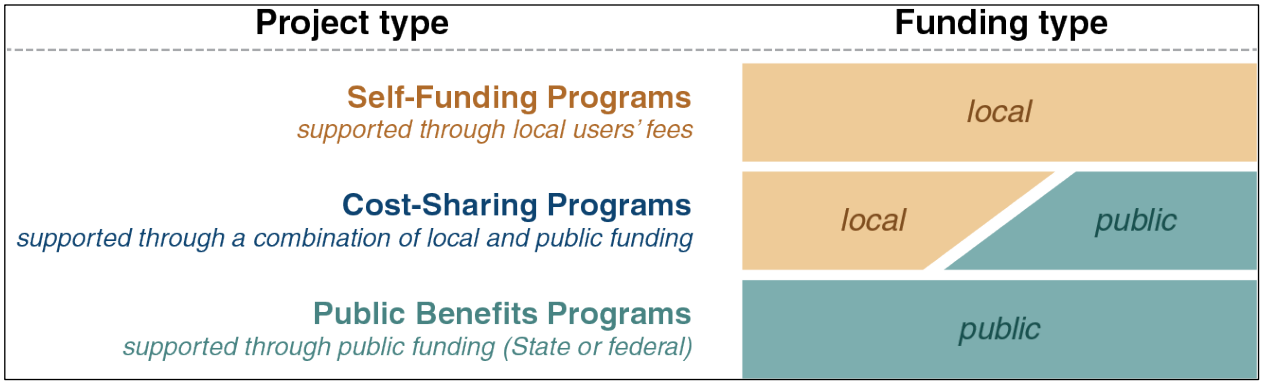
Update 2013 builds on strategies and actions to strengthen agency alignment from that presented in *California Water Plan Update 2009* (Update 2009). The primary purpose for improving alignment among and within federal, State, tribal, and local government agencies is to expedite implementation of resource management strategies and help assure efficient implementation of multi-benefit projects. (Refer to Volume 1, Chapter 4, "Strengthening Government Alignment," for a more detailed discussion.)

Invest in Innovation and Infrastructure

How California decides to prioritize and pay for necessary water resource management improvements is one of the most significant issues the state faces today. Past investments have provided a down payment and a good basis for further improvements; however, the financing methods of the past are no longer sustainable. The stakes are high as future investment decisions will significantly affect public safety, environmental stewardship, and economic stability. What is at stake includes flood risk to Californians' lives and assets; sustainability of natural resources, including the stewardship or extinction of species/habitats and the ecosystem services they can provide; and California's $2 trillion economy, which has significant value, both nationally and globally, and directly affects the fate of existing businesses, their employees, and their employees' families.

California has nearly $600 billion of assets and over 7 million people at risk of flooding. There are also over 10,000 projects identified within the 48 IRWM plans. In total, resource management actions will require up to $500 billion of future investment over the next few decades to reduce flood risk, provide reliable and clean water supplies, and enhance ecosystems and their services. The price tag is daunting, but failure to address these challenges will put more and more Californians at risk. We are beginning to integrate resource management and planning, but funding remains fragmented, unstable, and inefficient, which limits opportunities for further integration. In fact, many current funding practices/constructs, developed decades ago, drive investment priorities more so than emerging plans and stakeholder priorities (which have significantly changed over the last several decades). These rigid funding constricts also do not allow the adaptability necessarily to respond to emerging challenges.

Update 2013 calls for more strategic, disciplined, and aligned investments in innovation and infrastructure (both naturally occurring and human-made) and identifies shared stakeholder values and potential mechanisms for future financing. Moving forward, the State needs to clarify funding purposes, as well as assess and articulate the value of current and future expenditures, to secure the necessary investments that will deliver sustainable and resilient water resources. It will take decades to upgrade the aging water-related infrastructure and accomplish ecosystem improvements. However, we need to continue taking steps toward financing implementation of a diverse portfolio of water management actions with an equally diverse portfolio of funding sources, including self-funding, cost-sharing, and public benefit.



Self-Funding programs are primarily financed through revenue bond sales that are supported through users' fees. Many local major water-supply projects, including local and regional water-supply conveyance, treatment, distribution, and wastewater treatment, are included in this category. Some systemwide projects can also be included in this category. Small and isolated disadvantaged communities

are one exception, as many of their water supply systems need upgrades to provide adequate water supply and/or address their water quality issues. Typically, local/regional water purveyors' and wastewater agencies' user fees, with some exceptions, provide adequate funding for operation and maintenance of their water systems. Nonetheless, operation and maintenance of the flood management system by the State and local flood assessment districts is more challenging.

Cost-Sharing programs have local and regional benefits, as well as State and national benefits. Many of the proposed infrastructures fit within this category and are generally funded through a cost-shared agreement among the federal, State, and local agencies, depending on the program/project beneficiary. Examples of these types of projects include some regional water supply security projects and most flood protection projects. Many flood and community districts sell bonds secured by specific tax assessments to fund their capital improvements. Passage of Assembly Bill 218 in 1996 put new restrictions on this type of financing by requiring approval by two-thirds of voters. The result has been delays in some capital improvements and failure to approve others.

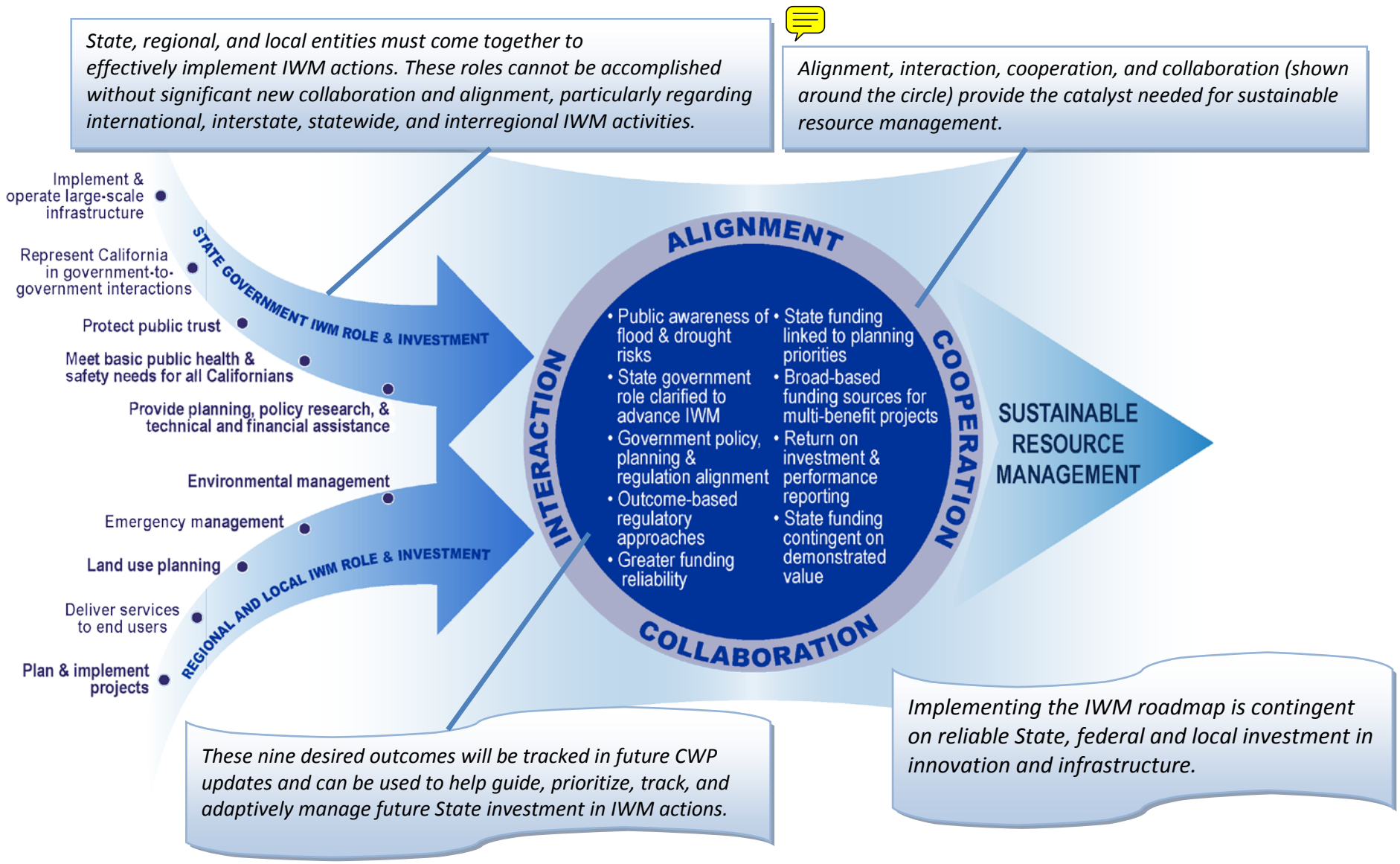
Public benefit programs have statewide and societal benefits. They are generally supported by State and federal public funding. Examples of these projects are the systemwide ecosystem enhancements, systemwide flood-risk reduction projects, and some watershed management programs. Cities, counties, and the State generally finance their capital improvement programs through General Obligation bonds, which are secured by full faith of the credit issuer. Many local agencies and disadvantaged communities may not have adequate funding or means of financing local shares of their infrastructure improvement through bond sales (i.e., lack of credit or high interest rates). In these cases, providing low-interest State and/or federal loans to local agencies to cover their local cost share of the project will be helpful.

Integrated Water Management in Action

The immediate and changing conditions, priorities, and challenges described in Update 2013 require that Californians step up existing efforts to provide integrated, reliable, sustainable, and secure water resources and management systems for our health, public safety, economy, and ecosystems — today and for generations. The State needs to continue to invest in innovation and infrastructure, as detailed in Chapter 7, "Finance Planning Framework." To accomplish this requires implementing a strategic water plan with vision and goals, and an implementation plan with objectives and near-term and long-term actions. The plan must build on State and stakeholder accomplishments since Update 2009, as well as the fundamental lessons of water resource management learned in recent years. The figure below emphasizes how State, regional, and local entities must come together (align) to deliver the resources needed to effectively implement (invest in) IWM actions. Several key IWM activities are summarized (in the arrows located on the left side of the figure, "Integrated Water Management in Action") for State, regional, and local government roles and investment. The roles of the respective government entities cannot be accomplished without significant new collaboration and alignment, particularly regarding international, interstate, statewide, and interregional IWM activities.

The outcomes shown in the circle represent key accomplishments that must occur to achieve the Update 2013 IWM vision and objectives. Volume 1, Chapter 8, lays out 17 objectives and a menu of more than 250 actions that can move California toward accomplishing the desired outcomes. These outcomes will be tracked in future CWP updates and can be used to help guide, prioritize, track, and adaptively manage future State investment in IWM actions. Alignment, interaction, cooperation, and collaboration (shown around the figure's circle) provide the catalyst needed for sustainable resource management.

Integrated Water Management in Action



Navigating the California Water Plan

While the entirety of Update 2013 is intended to inform the actions of water managers, the *Highlights* booklet (to be available in early 2014) and certain Volume 1 chapters are particularly helpful in advising future policies with a concise description of the water management needs facing California and with implementable recommendations to help accomplish the Update 2013 vision. Chapter 1, "Planning for Environmental, Economic, and Social Prosperity," provides a concise call for action from policy-makers, as well as a summary of major concepts that advance the State's commitment to IWM. Chapter 2, "Imperative to Invest in Innovation and Infrastructure," describes extensive conversations with stakeholders about the role of State government in IWM, the three themes for Update 2013, and how these themes can be used to support decisions. These conversations and the close collaboration with stakeholders, which used the vision, mission, goals, and principles as a compass, were instrumental in crafting the abovementioned 17 objectives and 250+ related actions discussed in Chapter 8, "Roadmap For Action." Chapter 8 also describes the vision and mission of Update 2013, IWM goals to help identify and prioritize future water management actions, and guiding principles to help planning and decision-making.

Even though the 17 objectives and the related actions are supported by hundreds of stakeholders and dozens of State agencies, they must be prioritized for implementation. These actions are intended to provide policy and lawmakers, resource managers and land use planners, communities and businesses, academia, and other water leaders with a foundation and framework for water planning and management, policies and practices, and public and private investments. They are also intended to inform legislative action for change.

To assist water managers with implementing these objectives and related actions, a "toolbox" of 30 resource management strategies is provided in Volume 3 of Update 2013. Federal, State, tribal, and local entities are encouraged to use these tools to advance IWM, strengthen agency alignment, and invest in innovation and infrastructure.

Integral to achieving the goals and objectives in Chapter 8, Chapter 7 provides a first-of-its-kind finance planning framework in which multiple requirements, perspectives, and previously non-integrated financing information can be considered. This framework is intended to be used as a cornerstone for stakeholders and policy-makers to work collaboratively through critical funding needs and issues, develop durable finance mechanisms, and identify reliable revenue sources.

The remaining chapters of Volume 1 (Chapters 3, 4, 5, and 6) provide the background and rationale for the actions described in Chapter 8.

Conclusion

Update 2013 provides a full description of California's planning backdrop and context, a call for action, and a recommended path toward sustainable water management. Update 2013 was crafted with extensive collaboration; it represents matters of most importance and urgency to stakeholders and several State agencies. The plan provides an actionable blueprint for California's water future. When combined with the planning backdrop and context, the Update 2013 "Roadmap For Action" provides practical, well-reasoned, and critical decision support that can be readily implemented by the governor, Legislature, and water leaders.

Chapter 1. Planning for Environmental, Economic, and Social Prosperity — Table of Contents

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Chapter 1. Planning for Environmental, Economic, and Social Prosperity

About This Chapter

The California Water Plan (CWP) is the State's strategic plan for managing and developing water resources statewide. The CWP is required by the California Water Code but does not create mandates or authorize funding. This chapter provides an overview of *California Water Plan Update 2013* (Update 2013), the 11th in a series of such plans prepared since 1957. Specifically, the chapter begins with a summary of the water resource issues facing the State — a call for action. The remainder of the chapter summarizes major concepts that advance this plan beyond *California Water Plan Update 2009* (Update 2009), significantly advancing the State's commitment to integrated water management (IWM).

Readers are encouraged to review the Update 2013 "Document Guide" within this volume to learn more about the organization of the various contents and topics contained in Update 2013.

A Call for Action

Despite significant physical improvements in water resource systems and in system management over the past few decades, we still face unacceptable risks from flooding, unreliable water supplies, continued depletion and degradation of groundwater resources, and habitat and species declines. Our interconnected system for using and managing water is extremely complex and subject to continually changing natural and human-made conditions. Moreover, our water resources provide critical support for the success of other dynamic systems: our ecosystems, social systems, and economic and market systems. However, many types of ecosystem services and infrastructure are no longer functioning or have exceeded their life cycles. For example, some Californians do not even have safe, clean water supplies.

Collectively, our biggest problem may be how we pay for necessary water resource management improvements. Past successful investments in water use efficiency, groundwater management, flood management, ecosystem improvements, and many other important resource management actions have provided a down payment and a good basis for further improvements. However, investments in our water resources have not been stable or effective enough to maintain, much less improve, our personal safety, financial stability, and way of life. Given the current global financial problems, strapped government budgets (local, State, and federal), and the State's high indebtedness and reduced ability to pay, it is unlikely that California can afford all necessary system improvements. Prioritization that reflects our values will be the key to making investments.

California still depends on many remnants from World War II-era investments and innovations (e.g., dams and canals). This practice is borrowing against opportunities for our future prosperity. If this practice continues, some degree of foreclosure on our future prosperity will occur in the form of societal catastrophes such as floods, droughts, and species/habitat extinction. Because our water resource system is very complex, making further improvements is complicated by several issues and challenges:

- A growing population, which may increase flood risk and water demands.
- Diversity in societal needs, priorities, and expectations.

- Habitat and species declines.
- Degraded surface water and groundwater quality.
- Declining groundwater levels.
- High groundwater depletion rates (and resulting land subsidence) in some areas of the state.
- Sustained drought conditions in the western United States.
- Seasonal, year-to-year, and geographical variability between water sources and locations of water uses.
- Uncertainties about current and future climate change impacts on floods, groundwater and surface water supplies, ecosystems, and sea level.
- Aging and obsolete water infrastructure.
- System maintenance that has been deferred because of lack of funding or difficulty in meeting regulations.
- Sporadic funding that ebbs and flows with the occurrence of floods or droughts and that lacks the predictability and reliability required for effective implementation.
- General obligation bond debt levels that are near an all-time high.
- Misaligned, complex, and often internally inconsistent government planning, policy, and regulation.
- Conflicting roles and responsibilities related to overlapping and narrow authorities and governance.

- ***Reduce flood risk Statewide.***
- ***Provide safe drinking water.***
- ***Improve water quality for fisheries and recreation.***

- ***Enhance Bay-Delta ecosystem.***
- ***Restore terrestrial and aquatic habitats.***
- ***Improve watershed management.***
- ***Raise awareness and increase stewardship.***

- ***Enhance State economic output.***
- ***Contribute to job creation and security.***
- ***Promote food production security.***
- ***Provide stable funding for infrastructure.***

These issues place significant risks on public safety, unique ecosystems, and the vital California economy. Everyone in California is affected to some degree by these issues and will benefit from system improvements that reduce impacts. For example, even if a given home is not inundated during a flood, the home's owner may not be able to get to work or may experience a disruption in services. And, as ratepayers and taxpayers, California's citizens are affected by damages and business disruptions as the State invests to recover from the disaster.

The stakes are immense, as future investment decisions will significantly affect:

- Future levels of flood risk to people's lives and assets.
- The sustainability of natural resources (including the potential prosperity or extinction of species/habitats and the ecosystem services they provide society).
- The sustainability and efficiency of surface water reservoirs and groundwater basins to provide reliable water supply to meet municipal and agricultural demands, and support ecosystem services.

- Types and levels of economic activity (including the fates of existing businesses, as well as the fates of employees and their families).
- California's $2 trillion economy, which has significant value both nationally and globally but is dependent on effective local, State, federal, and private natural resource policies and practices.

In recent years, regional and local entities have been investing in water resources management at a rate of about $18 billion per year. This constitutes the majority of the statewide investments, which total about $22 billion per year in local, State, federal, and private expenditures (more information and citations to source materials can be found in Chapters 2 and 7 within this volume and in Volume 4). This regional focus for water resource planning and implementation begs for a better definition of the role of State government in supporting regional activities and in promoting statewide policies and initiatives that recognize differences in needs from region to region. Investments in innovation and infrastructure (water system and ecosystem) need to focus on regionally derived, multi-objective actions; consider all resource development costs; and be fairly allocated among beneficiaries.

State, federal, and local agencies need to step up efforts to enhance California's business and finance climate by increasing the certainty that flood damages will be averted, that surface water and groundwater supplies will be reliable and predictable, and that recreational opportunities and environmental sustainability will be improved. Beginning with the three themes presented in the next section, Update 2013 provides a guide for strategic planning and investment that helps planners and policymakers overcome the complicated physical and institutional barriers to effective water resource management described earlier in this chapter.

Themes for Update 2013

Update 2013 contains a large variety of information, in five volumes. Although these volumes contain many refinements from Update 2009, Update 2013 also has significantly advanced the State's strategic plan in three critical areas. To address challenges and build upon past successes, Update 2013 focuses additional planning and recommendations regarding (1) IWM, (2) government agency alignment, and (3) strategies to invest in innovation and infrastructure.

These three topics can be considered themes for creating the strategic plan contained in Update 2013 (see Figure 1-1). These themes are interconnected and are never considered separately. IWM provides a set of principles and practices that include government agency alignment (and hence efficiency) through a collaborative and transparent planning process. This leads to stakeholder and decision-maker support for focused, cost-effective investment in various aspects of resource management. The Update 2013 strategic plan embraces these three themes as the basis for developing tools, plans, and actions and achieving results. Society's willingness and ability to pay for all government functions and services is decreasing, so these themes do not necessarily call for increased investment so much as for smarter, more efficient, and more effective planning and investment.

The following sections provide a summary of each of the three themes that advance Update 2013 beyond Update 2009.

PLACEHOLDER Figure 1-1 Themes of *California Water Plan Update 2013*

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Integrated Water Management

The first theme for Update 2013 is to build upon the foundation for IWM presented in Update 2009. IWM is a strategic approach to planning and implementing water management programs that combines flood management, environmental stewardship, and surface water and groundwater supply actions to deliver multiple benefits across watershed and jurisdictional boundaries.

IWM and integrated regional water management (IRWM) practices have made strides over the past 10 years, and Update 2013 encourages continuation and expansion of these practices. Chapter 2 of this volume, "Imperative to Invest in Innovation and Infrastructure," elaborates on the application of IWM in prioritizing future investments.

Update 2013 further clarifies and defines (using an outcome-based approach) the scope and focus of multi-objective IWM. Key IWM outcomes include improved system flexibility and resiliency, increased advocacy for multi-beneficiary projects from potential implementers and financiers, and delivery of benefits at a faster pace, using fewer resources than is possible from single-benefit projects.

Government Agency Alignment

The second theme for Update 2013 is to improve government agency alignment, a key process necessary for successful IWM. Update 2013 includes alignment strategies and actions to build on this concept that was introduced in Update 2009.

The primary purpose for better aligning local, State, and federal government agencies is to expedite the implementation of resource management strategies (RMSs) (see Volume 3) and help ensure efficient achievement of multiple objectives. This includes collaboration with regulatory agencies to reduce the time and costs required to implement IWM projects. Alignment would not alter agencies' authority or responsibility, but it would facilitate agencies working better together.

Currently, project implementers must navigate and comply with California's labyrinth of laws and regulations, developed by multiple agencies that sometimes operate in silos. This can lead to project delays and mounting planning and compliance costs. These challenges ultimately create significant difficulties in meeting basic community safety and water supply needs and also create difficulties in meeting the goals outlined in the CWP. It is important to acknowledge that regulations also provide basic community safety and water supply needs and help meet many CWP goals. Update 2013 promotes innovation for all IWM tools, including regulation and administrative tools.

At the same time, planning a project within the current regulatory environment is very technically and administratively complex, making it difficult for a single entity to comprehend all aspects of resource management and planning. For example, California has a wide variety of climates, landforms, and institutions, as well as a very diverse, place-based range of cultures that can best be described as constituting anthrodiversity (e.g., the human aspect of biodiversity that denotes the value of varied human habitats, such as rural, suburban, and urban communities) (see Chapter 3 of this volume, "California Water Today"). Accordingly, data management, planning, policymaking, and regulation must occur in a very collaborative manner, with the ultimate product being a composite of input and data from a large variety of elected officials, thought leaders, stakeholders, scientists, and subject experts.

Strides have been made to improve alignment, such as the formation and engagement of the CWP's State Agency Steering Committee and Federal Agency Network and of 48 regional water management groups.

However, local, State, and federal governments simply do not collaborate enough (and hence are often not aligned) to effectively manage the complexities described above. Impacts of insufficient alignment include the fact that planning and permitting of projects frequently exceed the implementation and operational costs for many infrastructure and ecosystem enhancement activities. In many cases, program and project implementation have yet to occur despite decades of planning activities.

Government agencies must institute a more coordinated, crosscutting, outcome-based, and regionally appropriate approach to achieve desired outcomes. The Update 2013 process was also designed to provide timely and meaningful participation by stakeholders. Update 2013 continued to develop new efforts to communicate, share information, and obtain feedback from California Native American tribal governments, federal agencies, topic-based caucuses, communities, academia, individuals, and organizations.

Investment in Innovation and Infrastructure

The third theme for Update 2013 is to create more stable and disciplined/strategic investment in innovation and infrastructure. A stable, effective funding stream is an essential component for successful water resource implementation. One of the most significant new features of the Update 2013 is a description of principles and strategies for future water financing.

In California, nearly $600 billion in assets and more than 7 million people are at risk of flooding. There are also several thousand water supply projects and other types of projects identified within the 48 IRWM plans, urban water management plans, and capital improvement plans. In total, resource management actions would require hundreds of billions of dollars of investment over the next few decades to reduce flood risk, provide reliable and clean water supplies, reverse degraded and declining groundwater basins and contain localized and regional land subsidence, and enhance ecosystems and their services. Funding for these investments remains fragmented, unstable, and inefficient, which limits opportunities for further integration. In addition, general obligation bond debt is near record levels.

Chapter 3 of this volume, “California Water Today,” details existing local, State, and federal IWM spending and debt levels. Historically, projects that tend to be the most implementable, the most consistent with priorities of a particular funding source — or that happen to be at the front of the queue when money becomes available — were often not linked to multifaceted strategic objectives. The approach used for Update 2013 promotes proactive planning and prioritization of activities to drive future investment decisions and funding. See Chapter 7 of this volume, “Finance Planning Framework,” for a description of finance strategies, including general obligation bonds, fees, taxes, and public private partnerships.

Two primary categories of investment are innovation and infrastructure. Innovation includes planning and prioritization improvements, such as the development of new analytical tools. Infrastructure includes structures and facilities that support human activities, but it also includes green infrastructure (e.g., wetlands, riparian habitat, and watershed systems). Both innovation and infrastructure must include initial upfront costs and long-term operation and maintenance costs, which have often been an afterthought to implementation and not adequately financed over a project’s useful life. Although innovation investments would help make better decisions and guide infrastructure investments, innovation would cost orders of magnitude less than infrastructure. This indicates that strategic investment in innovation can produce a very high return on investment over the long term by identifying the most cost-effective, robust, and beneficial solutions prior to making large capital investments.

Through intensive collaboration with the Update 2013 Finance Caucus, the investment categories presented in Box 1-1 helped participants toward a common understanding of potential investments. This approach can be used for aligning funding and finance planning processes across more than 2,300 local, State, and federal government agencies, each with its own planning processes and scales.

PLACEHOLDER Box 1-1 State Integrated Water Management Investment Categories

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Guide to Update 2013 Documents — Foundational and New Features

California Water Plan Update 2005 (Update 2005) marked a change in how the State prepared the CWP. For the first time, the document included a strategic plan prepared in a collaborative process that brought together DWR with an advisory committee representing urban, agricultural, and environmental interests. Update 2005 was the first CWP to explicitly include a strategic plan with a vision, a mission, goals, recommendations, and an implementation plan. Update 2009 updated and expanded these strategic plan elements. Update 2013 further updated the strategic plan.

Since the structure of these previous plans has proven useful, several foundational components have been continued for Update 2013 (see Figure 1-2). Foundational components include topics required by statute, as well as recurring features that were identified by stakeholders and CWP users as useful and important to maintain continuity across updates. All volumes contain material that has been updated since Update 2009 was released.

PLACEHOLDER Figure 1-2 Foundational Components of *California Water Plan Update 2013*

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Update 2013 presents the strategic plan in Volume 1. Within it, **Chapter 2, "Imperative to Invest in Innovation and Infrastructure,"** elaborates on the three themes introduced in Chapter 1 and describes the conditions and challenges that constitute an urgency to act. It also lays out the future role of State government in IWM. **Chapter 3, "California Water Today,"** includes a comprehensive description of current conditions, challenges, and initiatives for managing California's extreme and variable resources. Chapter 3 also details water uses and supplies (water portfolios) on a statewide basis. Moreover, a central feature of Update 2013 is the oversight of a 28-member State Agency Steering Committee. The steering committee's membership represents the complex and many-faceted nature of governing California's water resources at the State level. The committee's participation helped identify companion State plans that have a direct connection with the CWP, as discussed in **Chapter 4, "Strengthening Government Alignment."** The approach to defining and examining numerous future resource management scenarios through 2050 is outlined in **Chapter 5, "Managing an Uncertain Future."** Chapter 5 summarizes potential future water demand and supply conditions and evaluates the use of RMSs for three hydrologic regions (RMSs are covered in Volume 3 of Update 2013, and California's hydrologic regions are covered in Volume 2). **Chapter 6, "Integrated Data and Analysis: Informed and Transparent Decision-Making,"** contains information and data analysis, as well as key actions, needed to improve and implement strategies for use of water resources. **Chapter 7, "Finance Planning Framework,"** a new part of Update 2013, presents an approach for prioritizing State IWM investments, the role of State government and public funding, an estimate of future investments, and several strategies for financing improvements. **Chapter 8, "Roadmap For Action,"** sets forth the strategic vision, goals, objectives, and

principles that guided the preparation of Update 2013 and that provide the ideals for its implementation. This chapter also describes the future actions required to implement Update 2013 and related IWM plans.

Enhancements to Update 2013 — Adapting to Changing Decision-Support Needs

Update 2013 builds on and advances the evolution in planning that began with the Update 2005 process. As described earlier in this chapter, the major enhancements for Update 2013 compared with Update 2009 are the emphasis on the three overarching themes of IWM, government agency alignment, and investment in innovation and infrastructure.

In addition, during the Update 2013 scoping process in 2010, the many advisory bodies and the public suggested enhancements for Update 2013. The suggestions can be broadly grouped into five categories, for improvements in:

- New and expanded topics.
- Regional planning.
- Collaboration.
- Data, metrics, and analyses.
- Adaptive management.

Detailed descriptions of each proposal are provided in Volume 4, *Reference Guide.* Although all proposals for enhancements could not be accommodated within the scope of Update 2013, they serve as a starting point for scoping the next update of the CWP, to be released in 2018.

After an extensive collaborative process of screening and prioritization, the following enhancements for Update 2013, identified as critical for ensuring relevant and useful decision support, have been incorporated into the strategic plan by Update 2013 staff and stakeholders.

- New and expanded topics:
  - **Finance planning framework**.
    A. Critical State investment priorities for water supply, water quality, flood planning and management, and environmental stewardship activities were identified.
    B. Innovative, stable, equitable, and fiscally responsible financial strategies and revenue sources were recommended.
  - **New resource management strategies (RMSs)** — New RMSs were added for sediment management, outreach and education, and water and culture.
  - **Flood management** — Flood management, in the form of IWM, was incorporated throughout the CWP. This effort included thorough incorporation of the report *California's Flood Future: Recommendations for Managing the State's Flood Risk*, which presents a call to action and recommendations for reducing flood risk statewide.
  - **Surface and groundwater quality** — Regional and statewide water quality challenges were highlighted, and strategies were recommended to protect and improve water quality to safeguard public health and the environment and to improve water supply reliability.
  - **Groundwater conditions and management** — Data, basin descriptions, and other information about statewide and regional groundwater conditions and change in storage were expanded, and existing groundwater governance structures were evaluated for better understanding of groundwater management alternatives and, ultimately, more informed decisions.

  - **Water technology and science** — Information was identified and expanded relating to statewide and regional water technology needs, opportunities, and challenges for implementing new technologies in California. Development of Update 2013 was supported through in-depth discussions and deliberations of innovation, technology, applied research, science, and development topics and issues.
- Regional planning:
  - **Emphasis on planning at a regional scale** — Regional outreach was expanded, the scope of regional reports was increased to include regional RMSs, two-page summaries of regions were included in Update 2013's "Highlights," and recognition of IRWM plans and priorities was increased.
  - **Near-coastal resources** — Topics and issues were added to include near-coastal interfaces with regard to several issues with a nexus to the management of fresh water, such as: desalination brine disposal, the influence of freshwater runoff in near-coastal ocean environments, and the interface of ocean and freshwater habitats (i.e., anadromous fisheries).
- Collaboration:
  - **Expanded outreach and collaboration** — Seven topic-based caucuses were established, a Federal Agency Network was launched, five State agencies were added to the State Agency Steering Committee, and a new Tribal Advisory Committee was formed.
- Data, metrics, and analysis:
  - **Sustainability indicators** — An analysis framework was developed to identify, compute, and evaluate sustainability indicators that would help monitor progress toward reaching the goals and objectives of Update 2013.
  - **Improved data, metrics, and analysis methodologies** — Data and methods for quantifying alternative scenarios of future water demand and supply conditions were improved and were used to evaluate the performance of potential water management responses for Update 2013.
- Adaptive management:
  - **Update 2013 *Progress Report*** — A new, mid-process progress report was added, to assess progress on Update 2009 recommendations and suggest areas of focus for Update 2013.
  - **Climate change** — Greater detail and more regionally specific climate change information was provided for Update 2013 than was provided within Update 2009. This included regionally appropriate and statewide adaptation and mitigation strategies, RMSs, and climate change scenario decision support.

Progress Toward Implementing Update 2009 Objectives

Update 2009 included an "Implementation Plan" chapter with objectives and related near- and long-term actions. By statute, the CWP has no powers to mandate that its recommendations be funded or implemented. The plan must be furthered by agencies or voting bodies that can implement its tools, plans, and actions. IWM entities at the local, State, and federal level have initiated and completed many of these actions, and they continue to make progress on other actions. Generally speaking, notable progress includes better interagency communication and collaboration, improved understanding of climate change, and new analytical approaches and tools to help manage resources into the future.

Progress toward implementing Update 2009 is detailed in the Update 2013 *Progress Report* (Progress Report). The Progress Report assessed whether and to what extent the 13 objectives (and 115 related actions) of Update 2009 have been implemented. It also identified key implementation impediments, as well as better ways to articulate more measurable objectives for Update 2013. This information can be

used to direct the attention and resources of decision-makers, planners, and stakeholders to actions that are not progressing. The Progress Report also helped make the Update 2013 "Roadmap For Action" chapter (Chapter 8 of this volume) more implementable and measureable (for reporting in *Update 2018 Progress Report*). Table 1-1 is a summary of progress on the implementation of Update 2009 objectives and actions from the Progress Report.

PLACEHOLDER Table 1-1 Progress Report on Implementation of Update 2009

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

In addition to progress made specifically toward implementing the Update 2009 objectives and related actions, many related significant accomplishments have been made or are ongoing since 2009. For example, the 2009 water legislation package (described further in Chapter 3 of this volume, "California Water Today") represents major steps toward ensuring a reliable water supply for future generations, as well as restoring the Delta and other ecologically sensitive areas. There has been significant progress in implementing this legislation. Regional entities and water communities have continued to advance IRWM through the development of 48 regional planning entities and the allocation of more than $10 billion in general obligation bonds since 2009. State agencies have continued to seek alignment of data, plans, policies, and regulation. Almost universally across all programs, data and technology have greatly improved Californians' ability to better manage water resources and plan for future improvements. More complete descriptions of implementation progress can be found in the Progress Report; in Chapter 3, "California Water Today"; in Chapter 4, "Strengthening Government Alignment"; and in Volume 4, *Reference Guide.*

Table 1-1 Progress Report on Implementation of Update 2009

Update 2009 objective	Status	Trend
1. Expand Integrated Regional Water Management	Good	Neutral
2. Use and Reuse Water More Efficiently	Requires attention	Good
3. Expand Conjunctive Management of Multiple Supplies	Requires attention	Good
4. Protect Surface Water and Groundwater Quality	Requires attention	Good
5. Expand Environmental Stewardship	Requires attention	Neutral
6. Practice Integrated Flood Management	Good	Good
7. Manage a Sustainable California Delta	Good	Good
8. Prepare Prevention, Response, and Recovery Plans	Neutral	Requires attention
9. Reduce Energy Consumption of Water Systems and Uses	Neutral	Neutral
10. Improve Data and Analysis for Decision-making	Good	Good
11. Invest in New Water Technology	Good	Good
12. Improve Tribal Water and Natural Resources	Neutral	Requires attention
13. Ensure Equitable Distribution of Benefits	Unavailable	Unavailable

Figure 1-1 Themes of 2013 California Water Plan

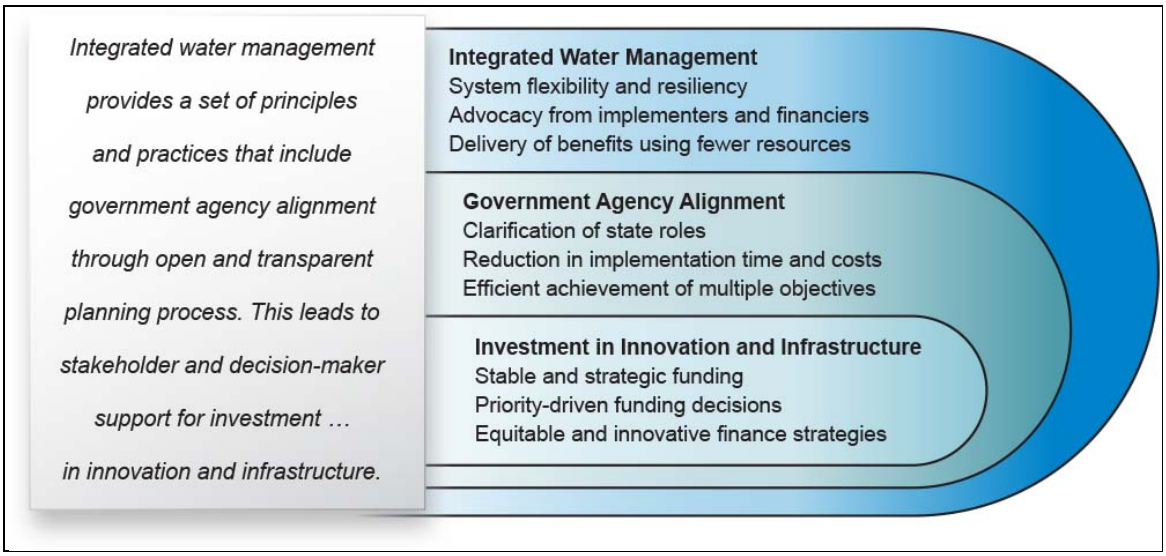
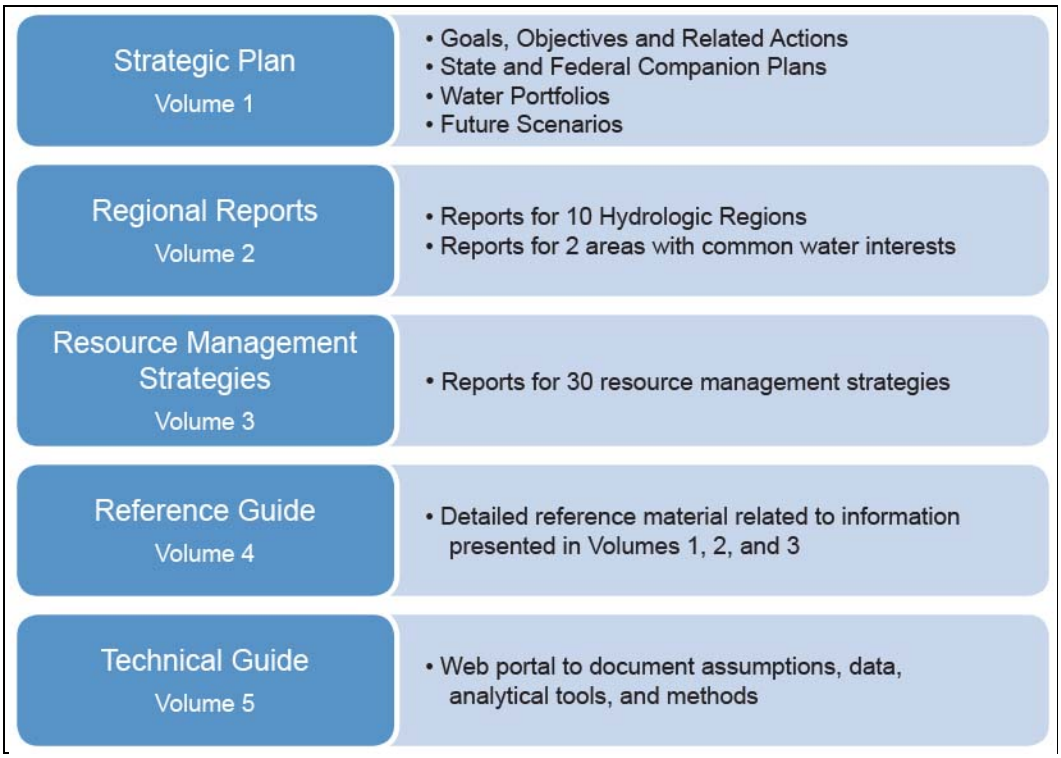


Figure 1-2 Foundational Components of the 2013 California Water Plan



Box 1-1 State Integrated Water Management Investment Categories

Innovation:

- Governance of State integrated water management (IWM) improvements.
- Planning and public engagement improvements.
- Strengthening government agency alignment.
- Information technology (data and analytical tools) improvements.
- Water technology and science advancements.
- Research, development, and implementation incentives.

Infrastructure (human and ecosystem), implemented at the following scales:

- Local.
- Groundwater basin.
- Watershed.
- Regional.
- Interregional.
- State.
- Interstate.
- International.
- Tribal.

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Chapter 4. Strengthening Government Alignment

About This Chapter

California's water management system is large, complex, and fragmented. Achieving successful implementation of integrated water management (IWM) requires communication, cooperation, collaboration, and alignment among decision-makers at all levels of federal, tribal, State, regional, and local entities. The *California Water Plan Update 2013* (Update 2013) is the State's water plan, and it is not an isolated effort of one agency. This chapter explores the many parts of California water management and the mechanisms leading to alignment of government policies and practices. To achieve this, the chapter cross-references and demonstrates coordination and collaboration with other State government programs to provide consistent strategic direction, goals, objectives, and actions. (For a detailed discussion of the objective and related actions for strengthening government alignment, see Table 8-16 in Chapter 8, "Roadmap For Action.")

This chapter describes the Water Plan State Agency Steering Committee as a key feature of Update 2013 and its efforts to create a plan that embraces all relevant State government plans, programs, policies, and regulations (see Box 4-1). The collaboration of the committee has expanded since *California Water Plan Update 2009* (Update 2009), growing to 28 State government agencies and departments with jurisdictions over diverse aspects of water resources.

The chapter also:

- Outlines key principles and goals for agency alignment.
- Provides a general overview of water management institutions and governance in California.
- Explains the roles of multiple agencies in regards to water.
- Explains the process for identifying and integrating recommendations from 37 featured State plans.
- Describes how featured State plans were used to develop and augment content in Update 2013.
- Concludes with a recap of the implications of the existing policy framework of featured State plans to shape, guide, and constrain water governance in California.

Strengthening Government Alignment

One of the three themes for Update 2013 (as outlined in Chapters 1 and 3 of this volume) is strengthening government alignment. The theme emphasizes the importance of aligning strategies and actions introduced in Update 2009. Agency alignment will expedite and reduce the cost of the implementation of resource management strategies (RMSs) and help ensure efficient achievement of multiple IWM objectives. Alignment does not alter agencies' authority or responsibility, but instead yields a result of agencies working together better.

Update 2013 promotes strategies and practices for significant improvements in government agency alignment. This includes better communication and collaboration to implement IWM activities while protecting and enhancing natural resources.

Laws and regulations provide the framework for basic community safety and water supply needs and ensure a healthy environment, vibrant economy, and social equity. They also help meet many California Water Plan (CWP) goals. At the same time, within the context of IWM, many requirements designed for single objectives can appear to work at cross purposes as multi-benefit projects often have more complex considerations that require trade-offs and balancing needs.

Often those who implement multi-benefit and IWM project must navigate California's labyrinth of laws and regulations. This sometimes leads to delaying projects and mounting planning and compliance costs. These impediments can ultimately create significant difficulties in meeting community safety, environmental, or economic goals along with achieving goals outlined in Update 2013. This may even be true for small projects that are well planned, have the voluntary support of the community and private landowners, and would provide multiple benefits.

Some project participants, such as landowners and investors, which have gone through the permitting process, are unwilling to tackle the process again. Those who have heard about the difficulties second-hand may opt out when presented with opportunities to contribute. (Refer to Table 8-16 in Chapter 8, "Roadmap For Action," for actions intended to strengthen government alignment.)

The solution is not to remove the safeguards of agency oversight. Project planning in California is technically complex and location-appropriate. These complexities exist because there are wide varieties of climates, landforms, and institutions as well as a very diverse, place-based range of cultures that can be described as anthrodiversity (e.g., the human aspect of biodiversity that denotes the value of sustaining varied human habitats, such as rural, suburban, and urban communities). This means achieving IWM requires that data management, planning, policy-making, and regulation occur in a very collaborative and regionally appropriate manner. The ultimate product of the collaboration is a composite of diverse input and data from a large variety of elected officials, opinion leaders, stakeholders, scientists, and subject experts. Sustainable outcomes will rely on a blend of subject expertise and perspectives woven together into comprehensive place-based and regionally appropriate policies and implementation.

The Update 2013 goals for agency alignment are based on several key principles:

- Agencies will remain autonomous.
- Action will be voluntary.
- No new infrastructure or planning effort will be created to manage alignment.
- Action will occur at multiple organizational levels.
- No single agency can solve some of the presenting issues by itself.

Instead of creating new institutions or organizational structures to manage alignment, agencies are encouraged to utilize simple self-organizing principles to collaborate and coordinate their activities in a manner that supersedes traditional silos and hierarchical management approaches. This is done with an understanding that alignment emerges from frequent interactions with three basic ingredients:

- Participants need to engage in strong, dynamic non-linear action and work across multiple organizational boundaries, not just up and down a chain of command. These interactions often result in immediate positive and negative feedback about what works, could work, or will need to be reconsidered so that only the best options are pursued.
- Participants need to take advantage of opportunities to interact and align as they become available while continuing to explore future potential interaction.

- The process of alignment consists of multiple interactions, similar to balancing while riding a bicycle, with continuous adjustments as requirements evolve.

Strides have been made to improve alignment with the formation and engagement of Water Plan State Agency Steering Committee, the Water Plan Federal Agency Network (FAN), and dozens regional water management groups. However, federal, State, tribal, and local governments do not yet collaborate to the degree necessary to effectively manage the challenges described above. For example, insufficient government alignment has resulted in situations where planning and permitting costs of projects exceeded the implementation and acquisition costs for many infrastructure and ecosystem enhancement activities. In other cases, program or project implementation has yet to occur despite decades of planning activities. All the while, benefits of projects are forgone due to implementation delays.

At the same time, funding and stakeholder support must occur prior to the effective delivery of desired IWM benefits. Enough certainty or confidence in the planned IWM activity is required to receive stakeholder support through the public administration process and, ultimately, receive funding from investors. None of these things can occur without extensive collaboration throughout the entire planning process.

If all partners have the same understanding of the project regardless of their individual needs, the project can be implemented more easily. Collaboration necessary to achieve stronger government agency alignment begins with establishing a common understanding at every stage of project or program development. Different partners have different perspectives on what they hope a project or program should achieve. For example, those implementing a project may think very differently about a project than a regulatory agency or those who are responsible for operating and maintaining a facility would think about it. State agencies may have different perspectives on a project. Each partner is influenced by public and stakeholder advocacy for system improvements and operations. In turn, this advocacy influences government policy-makers and financers at the State, federal, tribal, local, and regional government levels.

The purpose for emphasizing collaboration and strengthening alignment throughout the Update 2013 process goes well beyond sharing of information and project updates to stakeholders. Collaboration is required to help ensure that resource management recommendations achieve the desired outcome by vetting, integrating suggestions, and ultimately creating IWM recommendations that are implementable and supported by stakeholders and communities. It also helps create a CWP update process and a document that is accurate, complete, and clear.

Following are some examples of crosscutting practices that agencies can take to improve alignment. Many of these and others are represented in Chapter 8, “Roadmap For Action,” in this volume.

1. Identify all other agencies with overlapping or related responsibilities and engage them early and often during planning.
2. Respect and value the roles and responsibilities of other agencies (e.g., not seeking to affect other agencies’ budgets, responsibilities, or positions negatively).
3. Work together to identify common goals for IWM.
4. Strive to align goals and recommendations across all agencies’ plans.
5. Use an inclusive, transparent, and collaborative process to increase trust and improve relationships among agencies.

6. Coordinate monitoring and research on the highest priority innovations.
7. Use adaptive management to provide a framework for developing an accurate and common understating of natural and human-made systems and potential solutions.
8. Engage all levels of relevant participants (those doing the on-the-ground work up to those having a high level of oversight), starting at the early stages of planning.
9. Create a planning clearinghouse, which would manage data and a master calendar.
10. Develop fundamental principles that would guide alignment, which would be adopted jointly by State agencies.
11. Create a matrix showing where regulatory processes align, clash, or leave gaps.

Water Management and Governance in California

As noted above, California has a large and complex water system with highly decentralized governance that involves State and federal agencies, tribal governments, thousands of local agencies, districts, private firms, millions of households, and thousands of farms. Decentralization is important for autonomy and daily management, planning, and policy-making. Even so, competing and conflicting roles and responsibilities can make it difficult to integrate regional water management. Following is an overview of California's water management system. Creating a common understanding of its parts will, in itself, lead to better alignment.

Legal Framework

California's water governance structure has ancient roots in the oldest surviving common law in history, the public trust doctrine. Additional guidance for California is provided through the following:

- Terms and conditions of statehood granted by the federal government.
- California State Constitution.
- Code and statute including propositions.
- Regulations.
- Court mandates.

The concept of the public trust was developed in America as many independent states joined the original 13 colonies. The states were granted sovereign rights to the commons (water, air, and land) and sovereign responsibility for its care. Since then, the public trust doctrine has been used extensively to protect the public's interest in water. The courts have ruled water is owned by everyone and not by any one entity. Thus, protection must be provided by its steward, state government. This interpretation has been upheld by the U.S. Supreme Court. Some, but not all, states include a water code in their state constitution.

Surface Water Rights

Water rights laws in California and in the rest of the West are markedly different from the laws governing water in the East. Historic uses and patterns of settlement, seasonal, geographic, and quantitative differences in precipitation caused California's system to develop into a unique blend of primarily two different kinds of water rights — riparian and appropriative. Other types of water rights exist in California as well, among them are reserved rights (water set aside by the federal government when it reserves land for the public domain and tribes) and pueblo rights (a municipal right based on Spanish and Mexican law).

Riparian Rights

Riparian rights usually come with owning a parcel of land that is adjacent to a source of water. When it became a state, California adopted the English common law familiar to the Eastern seaboard; such law also included the riparian doctrine.

A riparian right entitles the landowner to use a correlative share of the water flowing past his or her property for use on that property. Riparian rights do not require permits, licenses, or government approval, but they apply only to the water, which would naturally flow in the stream. Riparian rights do not entitle a water user to divert water to storage in a reservoir for use in the dry season or to use water on a separate parcel of land that is non-riparian. Also, the water user cannot use riparian water on land outside of the watershed. With rare exception, riparian rights remain with the property when it changes hands, although parcels severed from the adjacent water source generally lose their right to the water.

Riparian rights still have a higher priority than appropriative rights (discussed below). The priorities of riparian rights holders generally carry equal weight. All share the shortage among themselves during a drought.

Appropriative Rights

Appropriative water rights generally pertain to non-riparian uses and storage of water from a time of plenty to one of scarcity. Appropriative water rights, as they exist today, came about as a result of a series of historical events.

Water rights laws in California were set on a different course in 1849, when fortune seekers flocked to the state after the discovery of gold. Water development proceeded on a scale never before witnessed in the United States as these “49ers” built extensive networks of flumes and waterways to work their claims. The water carried in these systems often had to be transported far from the original river or stream. These self-governing, maverick miners applied the same “finders-keepers” rule to water that they did to their mining claims. Water belonged to the first miner to assert ownership.

To stake their water claims, the miners developed a system of “posting notice,” which signaled the birth of today’s appropriative rights system. It allowed others to divert available water from the same river or stream, but their rights existed within a hierarchy of priorities. This “first in time, first in right” principle became an important feature of modern California water rights laws.

In 1850, California entered the Union as the 31st state. One of the first actions taken by its lawmakers was to adopt the common law of riparian rights. One year later, the Legislature recognized the appropriative right system as having the force of law. The appropriative right system continued to increase in use as agriculture and population centers blossomed and ownership of land was transferred from the State and federal governments to private ownership.

Up to the early 1900s, appropriators, most of them miners and non-riparian farmers, had simply taken control of water and used what they wanted. Sometimes notice was filed with the county recorder, but no formal permission was required from any administrative or judicial body.

The Water Commission Act of 1914 established today's permit process. This legislation created the agency that evolved into the State Water Resources Control Board (SWRCB) and granted it the authority to administer permits and licenses for California's surface water. The act was the predecessor to today's California Water Code (CWC) provisions governing appropriation.

These post-1914 appropriative rights are governed by the hierarchy of priorities developed by the 49ers. In times of shortage, the most recent (junior) right holder must be the first to discontinue the use of the natural flow of the water body. Each right's priority dates to the time the permit application was filed with the SWRCB. Although pre- and post-1914 appropriative rights are similar, post-1914 rights are subject to a much greater degree of scrutiny and regulation by the SWRCB.

The CWC establishes a procedure for the SWRCB to designate stream systems as fully appropriated. Designating a stream as such precludes the SWRCB from accepting any application to appropriate water from a specified stream system, except where the proposed application is consistent with the designation.

Beneficial Use

The conflicting nature of California's dual water rights system prompted numerous legal disputes. Unlike appropriative users, riparian rights holders were not required to put water to a reasonable and beneficial use. This clash of rights eventually resulted in a constitutional amendment (Article X, Section 2 of the California Constitution) that requires all use of water to be "reasonable and beneficial." These "beneficial uses" have currently include municipal and industrial uses, agricultural irrigation, hydroelectric generation, livestock watering, fish and wildlife protection, recreational use, and aesthetic enjoyment.

Per CWC Section 1707, individuals or groups of individuals can change an existing beneficial use to dedicate some or all of the water under their water right(s) to instream beneficial uses by submitting a petition for instream flow dedication. For example, some have pursued the concept of leasing surface water as a means of improving instream flows for salmon and steelhead by paying fair compensation to water right holders for the temporary instream use of all or part of their water use. Using CWC Section 1707 ensures that water right holders who participate in this process will not lose ownership of their water rights.

Fully Appropriated Streams

CWC Sections 1205 through 1207 establish a procedure for the SWRCB to adopt a declaration designating stream systems that are determined to be fully appropriated either year-round or during specified months. Placing a stream on the declaration precludes the SWRCB from accepting any application to appropriate water from a specified stream system, except where the proposed application is consistent with the declaration. California Code of Regulations, title 23, section 871 provides that the SWRCB may revoke or revise the declaration upon its own motion or upon petition of any interested person.

Groundwater Rights

In most areas of California, overlying landowners may extract percolating groundwater and put it to beneficial use. California does not have a permit process for regulating groundwater use. In several basins, however, groundwater use is subject to regulation in accordance with court decrees that adjudicated the groundwater rights within the basins.

The California Supreme Court decided in the 1903 case, *Katz v. Walkinshaw,* that the doctrine of reasonable use (as defined in CWC Section 100), which governs other types of water rights, also applies to groundwater. Previously, the English system of unregulated groundwater pumping was dominant, but this proved to be inappropriate to California's semiarid climate. This California Supreme Court case established the concept of overlying (or "correlative") rights, in which the rights of others with land overlying the aquifer must take reasonable use into account. Later court decisions established that groundwater may be appropriated for use outside the basin, although appropriator's rights are subordinate to those with overlying rights.

Conjunctive management of surface and groundwater supplies has opened up a new set of challenges, with regard to the State's somewhat fragmented surface and groundwater laws. Recharge and storage of surface water in a groundwater basin is legally viewed as though the storage were above ground. Any appropriation of water to be stored underground must be for a beneficial purpose and place of use, as is the case for surface storage. This means that groundwater storage applicants must declare the place and purpose of a beneficial use of the water to be stored. Concerns have been raised that it is difficult for groundwater recharge project applicants to specify future purpose and place of use. Nonetheless, without this specification, State regulators cannot corroborate the stated beneficial use. Further, if a surface water rights holder petitions to change their water rights to include the recharge of groundwater, their existing water rights could be put in jeopardy as a result of the petitioning process. This tends to discourage water rights holders from seeking the addition of groundwater recharge to their existing water rights. Some interests have proposed as a solution that groundwater recharge be declared a beneficial use, in which case the applicant would not have to specify place of use.

Tribal and Federal Reserved Water Rights

The federal-tribal relationship is complex. It is built around the doctrine of trust responsibility and a composite of factors. Water rights for federally recognized tribes are similarly complex and flow from the federal-tribal relationship, treaties, statutes, agreements, and are interpreted in case law.

In some cases, rights may include access to water for dependent uses such as fishing. In *United States v. Winans* (1905), the Yakima Nation went to court to preserve the "right of taking fish at all usual and accustomed places, in common with citizens of the Territory, and of erecting temporary buildings for curing them."

The U.S. Supreme Court upheld the Yakima Nation's right, even when the usual and accustomed places were owned by non-Native Americans. The court noted that the right to fish and to access traditional fishing grounds was not a special right granted by the government through treaty. Rather, the treaty simply acknowledged a right the Native Americans already possessed and that was reserved for their current and future use.

Another key area of federal water law involves the idea of water for reserved federal lands. In *Winters v. United States* (1908), the federal government went to court to prevent diversion of water that precluded water flowing to a tribal reservation. The result, called the Winters Doctrine**,** holds that land without water is valueless if water is essential for the purpose of the land. In this case, the purpose was tribal agriculture and ranching. The courts have also used the Winters Doctrine — reserving sufficient water to fulfill the purpose of reserved land — in deciding water rights for other kinds of reserved federal lands such as national forests and wilderness areas.

Pueblo Water Rights

Pueblo water rights are those exercised by a municipal successor to a Spanish/Mexican pueblo. The municipal successor must have taken possession of the right as of March 3, 1854. Only two pueblo water rights have been adjudicated in California — Los Angeles and San Diego. A pueblo water right is the highest priority (first in line) water right in California. It attaches to surface flow, including tributaries, and tributary groundwater of streams within the historic boundaries of the pueblo.

The quantity is determined by present municipal needs and grows over time. It cannot be lost by non-use or prescription and it is not subject to public trust claims although prohibition against waste and unreasonable use applies (Katz 2007).

Human Right to Water

On September 25, 2012, California Governor Edmund G. Brown, Jr. signed Assembly Bill (AB) 685 into law to ensure universal access to clean water. AB 685 places the human right to water at the center of State policy and underscores the role of State agencies in addressing the impact of unsafe water on humans. It requires State agencies to consider the human right to water when "revising, adopting, or establishing policies, regulations, and grant criteria" that impact water used for domestic purposes.

The bill, which added Section 106.3 to the CWC, reads:

- It is hereby declared to be the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.
- All relevant state agencies, including the department, the state board, and the State Department of Public Health, shall consider this state policy when revising, adopting, or establishing policies, regulations, and grant criteria when those policies, regulations, and criteria are pertinent to the uses of water described in this section.
- This section does not expand any obligation of the state to provide water or to require the expenditure of additional resources to develop water infrastructure beyond the obligations that may exist pursuant to subdivision (b).
- This section shall not apply to water supplies for new development.
- The implementation of this section shall not infringe on the rights or responsibilities of any public water system.

In the report *The Human Right to Water Bill in California, An Implementation Framework for State Agencies* (May 2013), the International Human Rights Law Clinic at University of California, Berkeley, School of Law provides an explanation of the key terms of the new law. The report explains the human right to water is more than just a declaration in statute. It creates an ongoing obligation for State agencies to consider the human right to water in every relevant agency decision and activity.

The law includes a list of specific values — safety, affordability, and accessibility — that agencies must consider when revising, adopting, or establishing policies, regulations, and grant criteria related to domestic water use. The courts have found in similar situations that this type of duty cannot be fulfilled through a single administrative action by a State agency. The bill's legislative intent was "to create a State policy priority and direct State agencies to explicitly consider the human right to water within their relevant administrative processes, measures, and actions."

By considering these values, State agencies can engage in responsive government decision-making and targeted programming that addresses the problems faced by disadvantaged and marginalized communities. The report concludes, "Human rights principles also foster a comprehensive approach to policy-making by focusing on underlying causes and systemic solutions in addition to individual remedies."

Water Law and Policy — Land and Agriculture

More than 43 percent of the land in California is used for food production. In contrast, California's urban use is 5 percent of California's land. Federal and State laws and policies tie water and agriculture together. When Congress passed the original Reclamation Act of 1902, the goals for water subsidies were to make the desert bloom.

Agricultural land has also been recognized in the California Constitution as meriting special status. This special status is implemented, in part, through the California Land Conservation Act (CLCA) of 1965, which is also called the Williamson Act. In the Legislative Declaration of the CLCA, the Legislature finds "That the preservation of a maximum amount of the limited supply of agricultural land is necessary to the conservation of the state's economic resources, and is necessary not only to the maintenance of the agricultural economy of the state, but also for the assurance of adequate, healthful and nutritious food for future residents of this state and nation."

A variety of codes and policies such as the California Agricultural Vision, aka AgVision, (California Department of Food and Agriculture 2010) articulate the preeminence of agriculture as critical to the CWP emphasis on a healthy environment, vibrant economy, and social equity. A recent report highlights a growing concern with food security, which is access to healthy food by a large number of Californians (Chaparro et al. 2012). Previous CWP updates have also reported on concerns regarding the adequacy of food as a national security issue and the Obama administration has identified food security as an element of foreign policy.

State and Federal Agencies/Departments with Water-Related Roles and Responsibilities

The State and federal governments are responsible for representing and protecting the public trust. In general, the featured agencies fill, often simultaneously, five general water-related stewardship roles:

- Regulator.
- Landowner.
- Service provider.
- Funder.
- Planner, technical advisor.

Those agencies that are landowners and service providers may also be regulated. Together, in addition to roles as landowners, the State and federal governments provide assistance, guidance, scientific review, monitoring, and oversight to local governments (city- and county-owned municipal water systems), Native American tribes, and special districts.

California Government Executive Branch, Boards, and Commissions

Many State agencies and departments oversee California's water resources. DWR operates the State Water Project and is responsible for overall water supply planning. The SWRCB integrates water rights and water quality decision-making authority and is responsible for overall water quality planning. The SWRCB and the nine Regional Water Quality Control Boards (RWQCBs) are responsible for protecting California's water resources. According to the Porter-Cologne Water Quality Control Act, water quality control plans (also known as basin plans) are prepared for each of the 10 hydrologic regions and by statute become part of the CWP. Below are other State agencies and departments and their roles in water management.

- **California Air Resources Board (ARB).** Promotes and protects public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants. Through its effort to reduce greenhouse gas emissions, ARB plays a role in ensuring that water is managed and used in ways that minimize greenhouse gas emissions.
- **California Business Transportation and Housing Agency (BTH).** Oversees the activities of 13 departments and several economic development programs and commissions. Its operations address financial services, transportation, affordable housing, real estate, managed health care plans, and public safety.
- **California Coastal Commission.** Plans and regulates land and water uses in the coastal zone consistent with the policies of the California Coastal Act.
- **California Department of Parks and Recreation (California State Parks).** Manages more than 270 State park units, which protect and preserve culturally and environmentally sensitive structures and habitats, threatened plant and animal species, as well as ancient Native American sites, historic structures, and artifacts. California State Parks is responsible for almost one-third of the state's scenic coastline and manages many of the coastal wetlands, estuaries, beaches, and dune systems.
- **Division of Boating and Waterways (DBW).** Became a division within the Department of Parks and Recreation in 2013. DBW develops public access to the waterways and promotes on-the-water safety with programs that include aquatic pest control in the Sacramento-San Joaquin Delta, coastal beach erosion control, and grants for vessel sewage pumpout stations.
- **California Department of Conservation (DOC).** Provides services and information that promote environmental health, economic vitality, informed land-use decisions, and sound management of California's natural resources. This department also manages a State watershed program.
- **California Department of Fish and Wildlife (DFW).** Regulates and conserves the State's wildlife and is a trustee for fish and wildlife resources. It is the State's primary department for managing native fish, wildlife, plant species, and natural communities for their intrinsic and ecological value. It serves a regulatory role by enforcing the California Endangered Species Act and Fish and Game Code Section 1600, Streambed Alteration Agreements.
- **California Department of Food and Agriculture (CDFA).** Promotes food safety, protects public and animal health, and protects California from exotic and invasive plant pests and diseases.
- **California Department of Forestry and Fire Protection (CAL FIRE).** Manages and protects California's natural resources. Provides fire protection and stewardship for more than 31 million acres of California's privately owned wildlands and offers varied emergency services in 36 of the state's 58 counties via contracts with local governments.

- **California Department of Pesticide Regulation (DPR).** Protects human health and the environment by regulating pesticide sales and use, and by fostering reduced-risk pest management. Plays a significant role in monitoring the presence of pesticides and in preventing further contamination of the water resource.
- **California Department of Public Health (CDPH).** Regulates public drinking water systems, oversees water recycling projects, grants permits for water treatment devices, certifies drinking water treatment and distribution operators, supports and promotes water system security, provides support for small water systems and for improving technical, managerial, and financial capacity, oversees the Drinking Water Treatment and Research Fund for methyl tertiary-butyl ether (MTBE) and other oxygenates in drinking water, and provides funding opportunities for water system improvements, including funding under Proposition 84, Proposition 50, and the Safe Drinking Water State Revolving Fund.
- **California Department of Toxic Substances Control (DTSC).** Provides technical oversight for the characterization and remediation of hazardous waste in soil and water.
- **California Emergency Management Agency (Cal EMA).** As part of the governor's efforts to streamline the State's emergency response capabilities, AB 38 combined the Office of Emergency Services and the Governor's Office of Homeland Security into this cabinet-level State agency in 2009. Cal EMA is responsible for overseeing and coordinating emergency preparedness, response, recovery, and homeland security activities in the state.
- **California Energy Commission.** Responsible for the forecast, regulation, and development and promotion of technology as the State's primary energy policy and planning agency.
- **California Environmental Protection Agency (Cal EPA).** Restores, protects, and enhances the environment to ensure public health, environmental quality, and economic vitality.
- **California Department of Resources Recycling and Recovery (CalRecycle).** Protects the environment and preserves resources by empowering Californians to reduce, reuse, and recycle.
- **California Public Utilities Commission (CPUC).** Regulates privately owned water and other utility companies.
- **California Water Commission (CWC).** Advises the Director of DWR on matters within the department's jurisdiction, promulgates rules and regulations, and monitors and reports on the construction and operation of the State Water Project. California's comprehensive water legislation, enacted in 2009, gave the commission new responsibilities regarding the distribution of public funds set aside for the public benefits of water storage projects, and developing regulations for the quantification and management of those benefits.
- **Central Valley Flood Protection Board (CVFPB).** Plans flood control along the Sacramento and San Joaquin rivers and their tributaries in cooperation with the U.S. Army Corps of Engineers.
- **Colorado River Board of California (CRB).** Protects California's rights and interests in the water resources provided by the Colorado River.
- **Delta Protection Commission (DPC).** Responsible to adaptively protect, maintain, and where possible, enhance, and restore the overall quality of the Delta environment consistent with the Delta Protection Act.
- **Delta Stewardship Council (DSC).** Responsible for preparing the Delta Plan that will guide State and local agencies to help achieve the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The Delta Plan will also guide protection and enhancement of the unique resources, culture, and values of the Delta as an evolving place.

- **Governor's Office of Planning and Research (OPR).** Provides legislative and policy research support for the Governor's Office. The State Clearinghouse, a department within OPR, coordinates the State-level review of environmental documents pursuant to the California Environmental Quality Act (CEQA), provides technical assistance on land use planning and CEQA matters, and coordinates State review of certain federal grant programs.
- **Native American Heritage Commission (NAHC).** Protects Native American burials from vandalism and inadvertent destruction, provides a procedure for the notification of most likely descendants regarding the discovery of Native American human remains and associated grave goods, brings legal action to prevent severe and irreparable damage to sacred shrines, ceremonial sites, sanctified cemeteries, and place of worship on public property, and maintains an inventory of sacred places.
- **California Natural Resources Agency.** Restores, protects, and manages the state's natural, historical and cultural resources for current and future generations using creative approaches and solutions based on science, collaboration, and respect for all the communities and interests involved.
- **Ocean Protection Council (OPC).** Ensures that California maintains healthy, resilient, and productive ocean and coastal ecosystems for the benefit of current and future generations.
- **Sierra Nevada Conservancy (SNC).** Initiates, encourages, and supports efforts that improve the environmental, economic, and social well-being of the Sierra Nevada region, its communities, and the citizens of California. The region, which comprises all or part of 22 counties and more than 25 million acres, is California's principal watershed that supplies 65 percent of the developed water supply.
- **California State Lands Commission (CSLC).** Manages public trust lands of the state, which includes the beds of all naturally navigable rivers, lakes, and streams, as well as the state's tide and submerged lands along more than 1,100 miles of California's coastline. The public trust doctrine is applied to ensure that the public trust lands are used for water-related purposes, including the protection of the environment, public recreation, and economic benefit to the citizens of California.
- **Strategic Growth Council (SGC).** Coordinates the activities of State agencies and partners with stakeholders to promote sustainability, economic prosperity, and quality of life for all Californians.

Federal Government

The federal government is a significant landowner in California. Approximately 48 million, or 48 percent, of the 100,206,720 total state acres are in federal ownership (Gorte et al. 2012). Most of this land is California's forest and Sierra Nevada regions, and the southeastern rural areas. For example, Inyo and Mono counties respectively have 92 and 84 percent federal ownership. Some counties with large urban centers have significant federal presence. San Bernardino County has more than 80 percent federal land ownership.

Management of federal lands in the state is particularly important to water mangers as these properties often contain significant watersheds and headwaters.

The largest federal landowners in California are the Bureau of Land Management and the U.S. Forest Service, followed by the National Park Service. The Department of Defense and the U.S. Fish and Wildlife Service also maintain large tracts of property. Beyond land ownership, many federal agencies play important roles in the planning, regulation, and management of California's water resources and water dependent uses. Some key federal agencies involved with water in California are:

- **U.S Department of Agriculture (USDA).** Provides services and leadership on food, agriculture, natural resources, rural development, nutrition, and related issues.
  Department of Defense (DOD). Manages an inventory of installations and facilities to keep Americans safe from outside aggression. DOD maintains a significant land base in multiple California locations with water, environmental, and ecosystem management requirements. DOD manages more than 30 million acres of land nationally.
- **U.S. Army Corps of Engineers (USACE).** Part of DOD that plans, designs, builds, and operates water resources projects such as navigation, flood control, environmental protection, disaster response, and recreation.
- **U.S. Environmental Protection Agency (EPA).** Protects human health by safeguarding the natural environment.
- **Federal Energy Regulatory Commission (FERC).** An independent agency that regulates the interstate transmission of natural gas, oil, and electricity. FERC also reviews and regulates proposals to license hydropower projects.
- **Federal Emergency Management Agency (FEMA).** As a part of the Department of Homeland Security, provides disaster response and recovery support including extreme weather events such as storms and drought. FEMA oversees the National Flood Insurance Program and the Flood Hazard Mapping Program.
- **U.S. Fish and Wildlife Service (USFWS).** Conserves, protects, and enhances fish, wildlife, plants, and their habitats.
- **U.S. Forest Service (USFS).** As part of the USDA, Manages forests, watersheds, and other natural resources. The USFS maintains multiple areas in California containing major headwaters.
- **U.S. Geological Survey (USGS).** Provides water measurement and water quality research.
- **U.S. Department of the Interior (DOI**). Protects America's natural resources and heritage, honors cultures and tribal communities, and supplies energy resources.
- **Bureau of Land Management (BLM).** Part of Department of the Interior, manages federal lands for multiple purposes including energy development, grazing, and recreation. The BLM provides land management in many watersheds.
- **Bureau of Indian Affairs (BIA**). As part of the U.S. Department of the Interior, promotes economic opportunity and carries out the responsibility to protect and improve the trust assets of Native Americans, Native American tribes, and Alaska Native tribes.
- **Indian Health Services (IHS).** Provides comprehensive primary health care and disease prevention services for Native Americans. IHS maintains programs that provide technical and financial assistance to Native American tribes and Alaska Native Communities (tribes) for the cooperative development and continuing operation of safe water, wastewater, solid waste systems, and related support facilities.

- **National Oceanic and Atmospheric Administration (NOAA).** As part of the Department of Commerce, a scientific agency focused on the conditions of the oceans and the atmosphere. NOAA warns of dangerous weather, charts seas and skies, guides the use and protection of ocean and coastal resources, and conducts research to improve understanding and stewardship of the environment.
- **National Marine Fisheries Service (NMFS).** Part of the National Oceanic and Atmospheric Administration. NMFS protects and preserves living marine resources, including anadromous fish.
- **National Park Service (NPS).** As part of the Department of the Interior, manages national parks, including their watersheds.
- **Natural Resource Conservation Service (NRCS).** As part of the U.S. Department of Agriculture, provides technical and financial assistance to conserve, maintain, and improve natural resources on private lands.
- **U.S. Bureau of Reclamation (USBR).** As part of the Department of the Interior, operates the Central Valley Project (CVP), which is the largest water project in California, and regulates diversions from the Colorado River.
- **Rural Development (USDA RD).** As part of the U.S. Department of Agriculture, manages financial programs for essential public facilities and services such as water and sewer systems, emergency service facilities, and electric and telephone service. USDA RD promotes economic development by supporting loans. Provides technical assistance and information to help agricultural producers and cooperatives get started and improve the effectiveness of their operations.
- **Secretary's Indian Water Rights Office (SIWRO).** As part of DOI, manages, negotiates, and oversees implementation of settlements of Indian water rights claims, with the strong participation of Native American tribes, states, and local parties.
- **Western Area Power Administration.** Manages power generated by the Central Valley Project.

During the Update 2013 process, many federal agencies actively supported development of CWP content. USBR and USACE both engaged with DWR in joint planning and modeling efforts used for development of CWP data and tools and scenario development. EPA entered into a joint planning effort for development of Update 2013 sustainability indicators and development of concepts like the water footprint. USGS has been engaged in multiple planning cycles to provide analytical support. The U.S. Forest Service has provided direct support to the CWP, starting with Update 2009, in the development and update of the resource management strategies and has been a key partner in Update 2013 in building multi-agency policies that support agency alignment. NRCS also became more actively engaged during Update 2013 and provided early support for the development of the sediment management resource management strategy, with direct involvement from the State Soil Scientist.

Tribal Governments, Organizations, and Communities

Just as historic uses, patterns of settlement, and seasonal, geographic, and quantitative differences in precipitation caused California's water system to develop differently than what is found in other states, the CWP definition of California Native American Tribe is also unique. It signifies all indigenous communities of California, including those that are not federally recognized, those that are federally recognized, and those with allotment lands, regardless of whether or not they own those lands. Additionally, because some water bodies and tribal boundaries cross state borders, this term includes indigenous communities in Oregon, Nevada, and Arizona that are impacted by water in California.

As described in the above section on Water Rights, the United States has a unique legal and political relationship with Native American Tribes and entities as provided by the Constitution of the United States, treaties, court decisions, and federal statutes. As a result, tribal governments are one of many governmental entities that may be responsible for ensuring that the water is safe and available in sufficient quantities for its intended purpose. Tribes may also be involved in a wide range of water management activities within their borders from protecting and managing surface waters, including reservoirs, watershed protection of wetlands, which are home to a wide diversity of plants and animals, and flood management.

Tribal governments work in collaboration with such federal agencies as the EPA, Bureau of Indian Affairs, Indian Health Service, USBR, and the DOI, among others to meet their water resources needs. Tribal governments and communities may also participate in local, regional, and statewide water planning and management activities at their discretion.

Some federal laws also allow for tribes to be treated as having the same legal and regulatory status as States. This is important for tribes that may want to exercise their jurisdiction over a subject matter that federal law puts them on par with States. In particular, the Clean Water Act, the Safe Drinking Water Act, and the Clean Air Act all have varying provisions that treat tribes as States.

Even with a strong governance structure, many tribal communities are served by substandard water systems. Contaminated watersheds and groundwater sources in many areas need major improvements. Multiple barriers often exist and extend beyond adequate funding to acquire updated infrastructure. Other issues include the affordability of ongoing operat and maintenance, and the ability to recruit and retain skilled personnel to manage these systems.

Water rights are also frequently mentioned by tribes as a source of contention. It is federal policy for tribal water right disputes to be resolved by negotiation rather than litigation. The DOI Secretary's Indian Water Rights Office (SIWRO) manages, negotiates, and oversees implementation of settlements of Native American water rights claims, with the strong participation of tribes, States, and local parties. SIWRO coordinates and supports federal settlement activities through 36 federal negotiation, assessment, and implementation teams working throughout the western United States. Staff on the federal teams comes from the DOI programs such as USBR and BIA.

While the federal government finds a settlement process is superior and less expensive than litigation, resolution of tribal water rights can be a lengthy and expensive process. Once settled, the right must then be implemented, which in many cases may take 5-15 years.

Tribes and California State Government

California has recognized the importance of creating a mutually respectful relationship with the tribes within its boundaries. To further this goal, Governor Brown issued Executive OrderB-10-11 in 2011. The order:

- Established the position of Governor's Tribal Advisor within the Office of the Governor.
- Directed the Governor's Tribal Advisor to oversee and implement effective government-to-government consultation between the administration and tribes on policies that affect California tribal communities.
- Confirmed the Office of the Governor shall meet regularly with the elected officials of California Native American tribes to discuss State policies that may affect tribal communities.
- Directed every Executive Branch State agency to encourage communication and consultation with California Native American tribes.
- Directed agencies and departments to permit elected officials and other representatives of tribal governments to provide meaningful input into the development of legislation, regulations, rules, and policies on matters that may affect tribal communities.

Since 2011, the Resources Agency and other Executive Branch organizations have developed policies to implement the order.

Tribes and the California Water Plan

The California Water Plan Tribal Advisory Committee assists in ensuring tribal input is reflected in all aspects of the Update 2013 planning process. This input assists the State in addressing the complex water issues facing California Native American Tribes.

A document prepared for the 2013 Tribal Water Summit, hosted in part by the California Water Plan Tribal Advisory Committee called the *Guiding Principles and Statement of Goals for Implementation***,** outlines three specific recommended actions to better integrate tribal considerations in the State's planning for water:

1. Tribes and State agencies should work together to develop strategies and approaches that incorporate traditional/tribal ecological knowledge better into water and water-related resource planning and management activities.
2. Tribes and State agencies should work together to develop strategies, educational materials, and recommendations that further the understanding of tribal uses of water and the broader role of water and access to water in tribal lifeways including subsistence and cultural practices.
3. Tribes and State agencies should work together to develop strategies and options for ensuring early and greater collaboration regarding water resource projects, as well as watershed and land use planning and management activities, especially where decisions impact tribal trust lands and/or traditional territories/homelands.

Public Agencies, Districts, Local Governments, and Investor-Owned Utilities

Local city and county governments and special districts have ultimate responsibility for providing safe and reliable water to their customers. More than 600 California water and irrigation districts are listed in the joint University of California, Riverside and the California State University, San BernardinoWater Resources Collections and Archives database.

In general, California has two methods for forming publicly managed special districts that develop, control, or distribute water: 1) enact a General Act under which the districts may be formed as set forth in the Act, and 2) enact a Special Act creating the district and prescribing its powers.

A 2010 list produced by the Senate Local Government Committee illustrates the complexity and magnitude of special districts that may be involved in some form of IWM activity is in Table 4-1.

PLACEHOLDER Table 4-1 Special Districts Involved in Some Type of IWM Activity

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

The total is 1,126 agencies, which is then combined with 58 counties and 482 incorporated cities. This does not include any of the agencies marked with an asterisk in the table, park districts, or fire districts that may have IWM responsibilities. Not all water suppliers and distributors are publicly managed. Mutual water companies, for example, are private corporations that perform water supply and distribution functions similar to public water districts. Many of the mutual water companies are small water systems. A small water system is defined as a water system for human consumption that has 15 or more service connections or regularly serves at least 25 individuals at least 60 days of the year. This includes any collection, treatment, storage, and distribution facilities. The California Department of Public Health (CDPH) is responsible for regulating these systems. In 31 of the 58 counties, CDPH has delegated local oversight to local primacy agencies (LPAs) for the regulation of public water systems serving fewer than 200 service connections. LPAs are county environmental health jurisdictions. LPAs regulate approximately 1,600 community water systems and 3,900 non-community water systems. Non-community systems are typically associated with a smaller number of users that may not be present year round, or transient locations like rest stops.

Investor-owned utilities in water activities are regulated by the California Public Utilities Commission (CPUC). CPUC regulates 152 water and sewer companies serving more than 23 percent of all Californians.

Integrated Regional Water Management Groups

Integrated regional water management (IRWM) is a voluntary, collaborative effort to manage all aspects of water resources in a region. IRWM crosses jurisdictional, watershed, and political boundaries. It involves multiple agencies, stakeholders, individuals, and groups, and it address issues and differing perspectives of all the entities involved through crafting mutually beneficial solutions.

California has 49 IRWMs that are recognized by DWR (see Figure 4-1). Most of these regions have an IRWM plan following principles established by the Legislature and guidelines developed by DWR. Some regions are developing their IRWM plans for the first time, while others are updating theirs. Individual IRWM plans deal with widely varying water resources conditions and establish regional goals and objectives.

PLACEHOLDER Figure 4-1 Integrated Regional Water Management Planning Regions Accepted or Conditionally Accepted by DWR as of Publication

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

At a minimum, a region is defined as a contiguous geographic area encompassing the service areas of multiple local agencies. Regions are defined to maximize integrated water management activities opportunities and effectively integrate water management programs and projects within a hydrologic region.

The Region Acceptance Process (RAP) is a component of the IRWM Program Guidelines. It is used to evaluate and accept an IRWM region into the IRWM grant program. The RAP is not a grant funding application; however, acceptance of the composition of an IRWM region into the IRWM grant program is required for DWR IRWM grant funding eligibility

IRWM is a prime example of integrated resource planning, which began in the late 1980s in the electric power industry, as a comprehensive approach to resource management and planning. When applied to water management, integrated resource planning is a systems approach that explores the cause-and-effect relationships between different aspects of water resource management, with an understanding that changes in the management of one aspect of water resources can affect others. Because water resources are often not tied to the boundaries of a single water management agency, a consensus-based, cross-jurisdictional, regional approach allows formulation of comprehensive solutions to regional water resource issues. The methods used in IRWM include a range of water resource management strategies, which relate to water supply, water quality, water use efficiency, operational flexibility, and stewardship of land and natural resources.

PLACEHOLDER Table 4-2 Key IRWM Events

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Resource Conservation Districts

Resource Conservation Districts (RCDs) are special districts and are a good example of strong local government. The 99 districts statewide are the center of locally led conservation in their communities and accomplish thousands of practical, hands-on conservation projects every year. Projects often involve agriculture and private land. Typical projects include:

- Water conservation.
- Watershed protection.
- Creek restoration.
- Stream bank restoration.
- Habitat improvement.
- Fish passage.
- Hedgerow plantings.
- Community education.
- Grower workshops.
- Native plantings.

- Creek cleanups.
- Educating agriculturists on better and new environmental practices, particularly around water conservation.
- Classroom visits.
- Fire prevention projects.
- Fire prevention education.
- Technical assistance to agriculturists.
- Watershed management.

Most RCDs do not receive taxpayer funding, and bring millions of dollars to local communities through conservation projects funded mainly through grants and private contributions. Those RCDs that receive tax dollars return every dollar at a 10 to 1 ratio.

Academic Institutions

California's public and private academic institutions play a vital role in California water management by providing research and other expertise to inform decision-making. Academics and policy experts from multiple universities are members of advisory councils, including those for the CWP, and prepare policy briefs to frame issues for public dialog. A small sample of CWP participation from California universities follows:

The International Center for Water Technology (ICWT) is part of California State University, Fresno State University, and was established in 2001 to educate, promote, and assist in developing and adopting innovative technologies that improve water utilization, reduce energy demand, and impact air quality positively. ICWT is provides direct expertise for the Water Plan Technology Caucus.

Faculty from the **University of California, Davis (UC Davis)** supports many aspects of data and information development for the CWP, ranging from development of sustainability indicators to providing peer reviews for technical tools.

California State University, Sonoma assisted with development of easy-to-use land use planning tools that illustrate water-land decision options. This effort has been a center piece of work by the Water Plan Land Use caucus.

The Water Resources Institute (WRI) is part of California State University, San Bernardino (CSUSB). WRI partners with DWR to coordinate the Alluvial Fan Task Force composed of county supervisors, local flood managers, developers, land use/environmental interests and representatives of State and federal agencies. The members were charged with developing a Model Ordinance (see http://aftf.csusb.edu/documents/DRAFT_MODEL_ORDINANCE.pdf) and local planning tools that would provide a model for future land use decisions on alluvial fans.

Center for Collaborative Policy (CCP), a unit of the College of Social Sciences and Interdisciplinary Studies at California State University, Sacramento, has provided neutral third party facilitation and technical advice on collaboration for the CWP since 2000.

State Agency Coordination through the Water Plan Steering Committee

To achieve comprehensive and integrated management of California's water resources, the Water Plan Steering Committee guided the development of Update 2009 (see Box 4-1). In the past, DWR had performed this role with little formal input from other State agencies. The Steering Committee collaborates to develop a more comprehensive CWP that strategically integrates California's water supply, water use efficiency, water quality, flood management planning, and environmental stewardship, as well as respective agency missions and goals.

PLACEHOLDER Box 4-1 Water Plan State Agency Steering Committee Member Agencies

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Working together, the State agencies sought to improve water governance by taking action on the following:

- Review and revise the vision, mission, and goals of the CWP, and update its implementation plan. Develop multiple scenarios of future California water conditions and use these scenarios to evaluate different combinations of resource management strategies, called response packages, for a range of water demand and supply assumptions.
- Develop climate change scenarios to evaluate impacts on California's water resources and water systems and identify and recommend statewide and regional adaptation strategies.
- Update the regional reports for the 10 hydrologic regions and for the Delta and Mountain counties as areas of special concern. Use information gained from the IRWM and local water and flooding efforts to describe critical issues, key initiatives, effectiveness of regional planning efforts, and region-specific response strategies.
- Update the 27 resource management strategies with current research and information and add three new strategies. Expand strategy narratives to describe their suitability for integrated flood management, new challenges, and their current and future implementation in various regions.
- Estimate and present actual water uses, supplies, and quality (water portfolios) for water years 2006 through 2010. Improve methods for representing consumptive and non-consumptive environmental water and where water reuse is occurring.
- Improve information exchange and data integration, data, and analytical tools to inform all CWP activities and decisions and to assist California water planners and managers.
- Incorporate findings and recommendations from featured State government plans and initiatives into Update 2013.

Agency Coordination through the Biodiversity Council

The California Biodiversity Council (CBC) was formed in 1991 to improve coordination and cooperation between the various resource management and environmental protection organizations at federal, State, and local levels. Strengthening ties between local communities and governments has been a focus of the council by way of promoting strong local leadership and encouraging comprehensive solutions to regional issues.

The council was not created to independently establish new projects, or to become another bureaucracy. Rather, its purpose is to discuss, coordinate, and assist in developing strategies and complementary policies for conserving biodiversity. Members exchange information, resolve conflicts, and promote development of regional conservation practices.

The council has 42 members, including 20 State agencies, 12 federal agencies, and 10 local governments. It is chaired by Secretary of the California Natural Resources Agency and the California State Director of the Bureau of Land Management. The council meets 2-3 times a year on issues relating to natural resource conservation in California.

In 2012, collaboration between the council and the CWP update process was established to align planning processes better and to interact more efficiently with federal agencies. One result was a joint convening of a Workshop to Align Agency Conservation Plans, Policies, and Programs held in October 2012. The results of this workshop led to the February 6, 2013 California Biodiversity Council Meeting in Davis where the co-chairs committed to a new resolution for the council entitled Strengthening Agency Alignment for Natural Resource Conservation. The resolution includes:

- Increasing coordination with all levels of governments and agencies (federal, tribal, State, local), stakeholder groups, private landowners, and others.
- Increasing effectiveness through leveraging of existing networks, relationships, and multiagency venues.
- Improving sharing of data, information, tools, and science among governments and agencies.
- Aligning planning, policies, and regulations better across governments and agencies and coordinate and streamline permitting to increase regulatory certainty.

The resolution also includes 11 principles, 11 practices and tools, and several organizational actions. The full text of Strengthening Agency Alignment for Natural Resource Conservation is at http://biodiversity.ca.gov/2013resolution.html.

Companion State Plans and the California Water Plan

A major effort of the State Agency Steering Committee was to identify State planning processes, policies, plans, and procedures that had a direct connection with the CWP. The goal was to create awareness among agencies and the public of related planning documents. This assessment allows agencies to work collaboratively to leverage each other's resources and objectives and overcome barriers.

There are three tiers of State agency plans — companion, nexus, and featured. A review gathered 191 companion State agency plans with some nexus to the issues considered in the CWP. At least 68 of those plans, referred to as nexus plans, had direct relevance to Volume 3, *Resource Management Strategies*; 37 plans, referred to as featured plans, informed the objectives and related actions in Chapter 8, "Roadmap For Action," of Volume 1, *The Strategic Plan*. The plans focus on different resources and programs respective to their agencies, but each provides part of the overall framework of California's water governance.

Featured State Plans

The 37 featured plans in Update 2013 (a subset of the nexus plans) substantially inform the water planning process (Box 4-2). In some cases, such as plans of the State Water Resources Control Board, the

relationship is legally required. In others, the relationship draws from a mutual governance responsibility. In collaboration with the State Agency Steering Committee, the CWP recognizes and intentionally reflects and incorporates key objectives and actions of the featured plans. This intentional conciliation builds alignment across multiple planning processes and agencies. Below are short descriptions of the 37 plans.

PLACEHOLDER Box 4-2 Featured State Plans in Update 2013

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

2009 California Climate Adaptation Strategy (California Natural Resources Agency)

To prepare for the expected impacts of climate change, California has developed a statewide adaptation strategy in coordination with efforts targeting greenhouse gas mitigation policies. This is a report to the governor in response to Executive Order S-13-2008. It synthesizes the most up-to-date information on expected climate change impacts to California for policy-makers and resource managers to provide strategies to promote resiliency to these impacts and develop implementation plans for short- and long-term actions. As part of the report, geographical maps and interactive planning tools are available to help local communities assess what climate impacts may happen in their area. As California's adaptation effort continues, more region-specific planning tools will be made available to help communities plan effectively for climate change.

2010 Strategic Fire Plan for California (Department of Forestry and Fire Protection)

The California Fire Plan is the State's road map for reducing the risk of wildfire. The Fire Plan is a cooperative effort between the State Board of Forestry and Fire Protection and the California Department of Forestry and Fire Protection (CAL FIRE). By placing the emphasis on what needs to be done long before a fire starts, the Fire Plan looks to reduce firefighting costs and property losses, increase firefighter safety, and to contribute to ecosystem health.

2012 Central Valley Flood Protection Plan (DWR)

The Central Valley Flood Protection Plan (CVFPP) guides the State's investment in flood management in the Sacramento and San Joaquin River basins and provides a basis for coordinating with federal and local agencies in implementation. Prepared with significant public input, the CVFPP identifies a systemwide investment approach for sustainable, integrated flood management, focusing on areas currently protected by facilities of the State Plan of Flood Control (SPFC). Utilizing the most comprehensive evaluations to date for flood damage reduction, potential life loss, and environmental restoration opportunities, it guides flood management investments in the range of $14 to $17 billion during the next 20 to 25 years.

The primary goal of the CVFPP is to improve flood risk management by reducing the chance and consequences of flooding and improve public safety, preparedness, and emergency response. The CVFPP also includes the following supporting goals:

- Improve operations and maintenance.
- Promote ecosystem functions.
- Improve institutional support.
- Promote multi-benefit projects.

Prepared by DWR and adopted by the Central Valley Flood Protection Board, the CVFPP is updated every five years, with each update providing support for subsequent policy, program, and project implementation. Implementation of the plan will require preparation of regional- and State-level financing plans.

2012 Integrated Energy Policy Report (California Energy Commission)

Senate Bill 1389 (Chapter 568, Statutes of 2002) requires the California Energy Commission to prepare a biennial integrated energy policy report that contains an assessment of major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources, protect the environment, ensure reliable, secure, and diverse energy supplies, enhance the state's economy, and protect public health and safety. The Energy Commission prepares these assessments and associated policy recommendations every two years as part of the *Integrated Energy Policy Report*. Preparation of this report involves close collaboration with federal, State, and local agencies and a wide variety of stakeholders in an extensive public process to identify critical energy issues and develop strategies to address those issues.

Alluvial Fan Task Force, Findings, and Recommendations Report (Alluvial Fan Task Force)

The Alluvial Fan Task Force (AFTF) was established by legislation and charged DWR with appointing a diverse stakeholder group that would examine the unique flood risks and environmental issues associated with development on alluvial fans and also provide recommendations to the Legislature to reduce flood risks and unintended environmental consequences in future development on alluvial fans. Throughout the AFTF process, the members collaborated to identify general findings that local governments should consider when planning for or considering future development on alluvial fans. Based on these findings, fourteen recommendations emerged that the State and other public agencies should consider when planning for or considering future development on alluvial fans. (See *Alluvial Fans Task Force Findings and Recommendations Report* at http://aftf.csusb.edu/documents/FINDINGS_Final_Oct2010_10-29-10_web.pdf.)

Bay Delta Conservation Plan

The proposed Bay Delta Conservation Plan (BDCP) is a comprehensive conservation strategy designed to address critical environmental and water delivery issues in the Sacramento-San Joaquin Delta with an ecosystem-based approach. The BDCP supports the coequal goals of habitat restoration and reliable water supply set forth in the Sacramento-San Joaquin Delta Reform Act of 2009.

The BDCP is a Habitat Conservation Plan and Natural Community Conservation Plan developed in compliance with the federal Endangered Species Act and the California Natural Community Conservation Planning Act. The plan would be implemented over a 50-year-period and seeks long-term take permits. As a planning document, the BDCP describes the proposed actions to improve the condition of habitat and species in the Delta, reduce adverse effects of water diversions on the covered species, and provide a reliable water supply.

While the BDCP is meant to be beneficial to the environment, specific actions in the plan can have an impact on natural and human environments. These impacts must be evaluated and actions identified to mitigate them. State and federal environmental laws require a review of potential impacts of the BDCP before it can be approved and implemented. As a result, the BDCP Environmental Impact Report/Environmental Impact Statement (EIR/EIS) was prepared in compliance with the California Environmental Quality Act and the National Environmental Policy Act.

The BDCP, the EIR/EIS, and supporting documentation will provide the basis for informed decision-making, including applications for issuance of endangered species incidental take permits for facility and operational changes to the State Water Project.

California Agriculture Vision: Strategies for Sustainability (Department of Food and Agriculture)

Agriculture Vision, aka AgVision, is more than a set of policy recommendations. It is a platform for thoughtful engagement of diverse stakeholder views about California's food and agriculture system, and it is a call for leadership by all those concerned about the future of California agriculture and its continued critical role.

California Drought Contingency Plan (DWR)

The California Drought Contingency Plan is a statewide plan for minimizing drought impacts by improving agency coordination, enhancing monitoring and early warning capabilities, water shortage impact assessments, and preparedness, response, and recovery programs. The plan identifies an integrated, regional approach to addressing drought, drought action levels, and appropriate agency responses as drought conditions change.

California Native American Tribal Engagement in the California Water Plan Update 2013 — Tribal Engagement Plan (CWP Tribal Advisory Committee)

The California Water Plan Update 2013 Tribal Engagement Plan continues the relationships built between State agencies and California Native American Tribes during Update 2009. The Tribal Engagement Plan is not a consultation process, but a document for how Update 2013 intends to build on the work from Update 2009 in approaching its goal of increasing tribal involvement. The objectives for engaging California Native American Tribes in Update 2013 include:

1. Begin addressing the complex tribal water issues identified during Update 2009, including at the 2009 Tribal Water Summit and in Update 2009's Objective 12 of the Strategic Plan (see Volume 1, Chapter 7 of Update 2009).
2. Integrate tribal information and tribal perspectives in the CWP, including but not limited to the *Strategic Plan*, *Regional Reports*, and *Resource Management Strategies*.
3. Improve the overall quality and comprehensiveness of the CWP, making it a more relevant and useful document.
4. Educate many water professionals about tribal water issues and water management strategies.
5. Increase tribal inclusion and engagement in water planning throughout California.

California Ocean Protection Council Five-Year Strategic Plan 2012-2017 (Ocean Protection Council)

In 2012, the Ocean Protection Council (OPC) released a 5-year update to their original strategic plan. The OPC was created through the California Ocean Protection Act (COPA) in 2004 to help protect, conserve, and maintain healthy coastal and ocean ecosystems and the economies they support. The OPC works with diverse interests and provides the leadership needed to meet the accelerating and complex contemporary challenges as set forth in COPA. The new strategic plan for fiscal year 2012-2013 through fiscal year 2016-2017 proposes OPC action in areas of critical need where the council's involvement can yield tangible progress and have the greatest impact. The OPC will focus on five areas over the next five years:

1. Science-based decision-making.
2. Climate change.
3. Sustainable fisheries and marine ecosystems.
4. Coastal and ocean impacts from land-based sources.
5. Existing and emerging ocean uses.

California Outdoor Recreation Plan (Department of Parks and Recreation)

The California Outdoor Recreation Plan (CORP) is the State's strategy for identifying the wide range of ways in which recreation providers can deal with obstacles and create the outdoor recreation opportunities to meet current and future public demand. The CORP and associated research provide strategies for all public agencies (federal, State, local, and special districts engaged in providing outdoor recreation lands, facilities and services throughout the state) for meeting the outdoor recreation needs of Californians. The CORP presents valuable information about participation, and demand for water-dependent outdoor recreation activities including fishing, motor boating, paddle sports, and swimming. The plan inventories protected lands throughout the state, compiles public opinions about outdoor recreation and the management of public waters and lands, describes why wetlands are important recreation resources, and addresses the California Recreation Policy.

California Forest and Rangelands: 2010 Assessment and 2010 Strategy Report (Department of Forestry and Fire Protection)

The report, *California's Forests and Rangelands: 2010 Assessment*, has been completed by CAL FIRE's Fire and Resource Assessment Program (FRAP). It highlights key policy issues and options for the subsequent strategy document, which provides the framework for State and federal programs that support good forest and rangeland stewardship in California.

California Strategic Growth Council Strategic Plan 2012-2014 (California Strategic Growth Council)

This strategic plan lays out a comprehensive three-year work plan for the California Strategic Growth Council. It also defines the council's vision, mission, and various roles and responsibilities. The work plan is based on four strategies that follow the legislative mandates of the Strategic Growth Council. The strategies are supported by 12 actions identified to accomplish the strategic objectives. To enhance common understanding, a high-level description is provided of the purpose and proposed methods for accomplishing each action.

California's Flood Future: Recommendations for Managing the State's Flood Risk (DWR)

DWR and the USACE developed *California's Flood Future: Recommendations for Managing the State's Flood Risk*, a comprehensive look at statewide exposure to flood risk. The draft report identifies and addresses the barriers to improved flood management and provides information intended to inform decisions about policies and financial investments to improve public safety, foster environmental stewardship, and support economic stability. Information used to develop *California's Flood Future* was provided by more than 140 public agencies. *California's Flood Future* is a companion plan to Update 2013.

California's Water Commission Strategic Plan 2012 (California Water Commission)

The California Water Commission's Strategic Plan 2012 outlines California's water challenges and the California Water Commission's goals and strategies to address those challenges. The plan discusses critical issues in California's water management, the history of the commission, and defines its roles and duties. It also highlights the commission's newly adopted mission statement, major goals, and strategies for achieving those goals.

California Transportation Plan 2025 (Department of Transportation)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan for meeting the state's future mobility needs. The CTP defines goals, policies, and strategies to achieve a collective vision for California's future transportation system. This plan, with a minimum 20-year planning horizon, is prepared in response to federal and State requirements and is updated every five years. The current CTP 2025 was approved in 2006 and updated by an Addendum in October of 2007 to comply with new federal planning requirements governing development of the plan.

California Wildlife Action Plan (Department of Fish and Wildlife and Wildlife Health Center at University of California, Davis)

The California Department of Fish and Wildlife, working in partnership with the Wildlife Health Center at University of California, Davis, directed the development of *California Wildlife: Conservation Challenges*. This report identifies species of habitats of greatest conservation need, the major stressors affecting native wildlife and habitats, and statewide and region-specific actions needed to restore and conserve California's wildlife.

Climate Change Scoping Plan: A Framework for Change (California Air Resources Board)

The Global Warming Solutions Act of 2006 (AB 32) required the ARB to prepare a scoping plan to achieve reductions in greenhouse gas (GHG) emissions in California. The scoping plan, approved by the ARB in December 2008, provides the outline for actions to reduce California's GHG emissions.

Department of Toxic Substances Control Strategic Plan 2011-2016 (Department of Toxic Substances Control)

The Department of Toxic Substances Control's (DTSC's) strategic plan is a living document. It is aligned with their operations and is designed to focus on safeguarding communities, protecting the health of all residents, restoring land and water to safe levels, and maximizing effectiveness and efficiency to better serve Californians. Immediate threats are mitigated by protecting the public and/or implementing enforcement action. Long-term threats are mitigated by removing exposure or are avoided by substituting

safer consumer products. Threats may be in the air, soil, or water on tribal, federal, State or private lands. Mitigating these threats requires DTSC to work across organizational boundaries with local, State, federal and national organizations. DTSC also administers the federal Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Superfund programs for the EPA, and manages orphan funds designated for use to clean up abandoned and/or neglected properties that can be usefully re-developed.

Environmental Goals and Policy Report (Governor's Office of Planning and Research)

The 2012 Environmental Goals and Policy Report (EGPR) provides an overview of the State's environmental goals, keys steps to achieving these goals, and a framework of metrics and indicators to help inform decision-making at all levels to help the State to reach these goals.

Delta Plan (Delta Stewardship Council)

The 2009 Delta Reform Act created the Delta Stewardship Council and required that it develop a legally enforceable, long-term management plan for the Delta to achieve the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. These coequal goals must be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place. This Delta Plan focuses on a number of key strategies to achieve these coequal goals.

General Plan Guidelines (Governor's Office of Planning and Research)

Governor's Office of Planning and Research (OPR) has begun its update of the *2003 General Plan Guidelines.* This document provides assistance to local governments for developing their long-range general plans. The update will include pertinent new statutory and legal requirements along with advice for planners, elected officials, and the general public on how a general plan can be used to achieve a sustainable, livable community.

Recycled Water Policy (State Water Resources Control Board)

The Recycled Water Policy was adopted by State Water Resources Control Board in 2009 and is intended to increase the use of recycled water from municipal wastewater sources in support of the SWRCB's Strategic Plan priority to promote sustainable local water supplies. Increasing the acceptance and promoting the use of recycled water is a means towards achieving sustainable local water supplies and can result in reduction in greenhouse gases, a significant driver of climate change. The policy is also intended to encourage beneficial use of recycled water.

Regional Water Quality Control Plans (10 Basin Plans — State Water Resources Control Board)

The water quality control plans, or basin plans, for the 10 hydrologic regions are the State's water quality control planning documents. They designate the beneficial uses and water quality objectives for all surface water and groundwater. They also include implementation programs to achieve water quality objectives. Basin plans are developed and adopted by the Regional Water Quality Control Boards and then approved by the SWRCB, the EPA, and the Office of Administrative Law, where required.

San Francisco Bay/Sacramento — San Joaquin Delta Estuary Water Quality Control Plan (State Water Resources Control Board)

In December 2007 and January 2008, resolutions adopted by the SWRCB directed staff to develop a strategic work plan that describes the coordinated activities of the SWRCB to address Bay-Delta issues, prioritizes the scope of individual activities, and specifies timelines and resource needs. It describes high-priority Bay-Delta activities that the SWRCB will continue through 2013.

The SWRCB recognizes that it has neither the capacity nor the responsibility to conduct all the planning and implementation activities needed to protect and restore fisheries, aquatic habitats, and other beneficial uses in the Bay-Delta. Accordingly, the work plan identifies activities that will need to be coordinated with other efforts. Overall, the work plan identifies a range of actions that constitute a reasonable sharing of responsibility to protect the Bay-Delta and the public trust, while still protecting diverse public interests.

Sierra Nevada Conservancy Strategic Plan (Sierra Nevada Conservancy)

The Sierra Nevada Conservancy Strategic Plan 2011 sets priorities for the conservancy within the context of its broad mission and statutorily established program areas, and focuses efforts on measurable and attainable actions over the next three years. This plan, to be implemented in ongoing collaboration with multiple partners, will be carried out through specific actions identified in a series of annual work plans, beginning with the Sierra Nevada Conservancy's 2012-13 Action Plan that establish realistic actions by fiscal year in support of the established priorities.

Sierra Nevada Conservancy 2012-13 Action Plan (Sierra Nevada Conservancy)

The Action Plan contains the major initiatives and activities to be undertaken by the Sierra Nevada Conservancy between March 2012 and June 2013, consistent with the Sierra Nevada Conservancy Strategic Plan.

Small Water System Program Plan (California Department of Public Health)

California Department of Public Health (CDPH) has developed a Small Water System Goal that brings small community water systems into sustainable compliance with primary drinking water standards. CDPH has developed an implementation plan that defines specific tasks to achieve the goal as well as measureable results of progress. CDPH will focus on third-party provider services and internal efforts toward these systems in order to bring them into compliance. The intent is to direct attention and resources toward these systems to help them find a solution and develop their technical, managerial, and financial capacity that will ensure sustainability into the future.

State Coastal Conservancy Strategic Plan 2013-2018 (California Coastal Conservancy)

The California Coastal Conservancy's 2013-2018 Strategic Plan identifies key issues for the California coast over the next five years including the steps needed to respond to climate change. The plan includes an overview of agency priorities in the context of California's coastal management program, a delineation of coastal issues by region, and a summary of the agency's financial status and needs. The plan describes the conservancy's overall vision and identifies specific metrics to measure the effectiveness of the Coastal Conservancy's work. In addition, it includes a summary of the Coastal Conservancy's past accomplishments.

State of California Emergency Plan (California Emergency Management Agency)

The State of California Emergency Plan outlines a State-level strategy in support of local government efforts to protect the public during a large-scale emergency. In accordance with the California Emergency Services Act, the State Emergency Plan describes:

1. Methods for carrying out emergency operations.
2. The process for rendering mutual aid.
3. Emergency services of governmental agencies.
4. How resources are mobilized.
5. Public information.
6. Continuity of government.

The plan is intended to establish statewide emergency management policy and provide guidance and standardization for use by all stakeholders.

State Multi-Hazard Mitigation Plan (California Emergency Management Agency)

Cal EMA led the effort to complete the 2010 Enhanced State of California Multi-Hazard Mitigation Plan (SHMP), which includes a flood component. The SHMP is the official statement of the State's hazard identification, vulnerability analysis, and hazard mitigation strategy. The SHMP is the result of a collaborative multi-agency planning process that included DWR.

Strategic Plan for the Future of Integrated Regional Water Management (DWR)

The purpose of this new plan is to advance IRWM, further enable, empower, and support regional water management groups, and better align State and federal programs to support IRWM. There has been ten years of progress implementing IRWM. Developing this plan further will involve significant engagement of stakeholders to review the progress made and plan for the future, especially considering possible future funding challenges.

The Climate Action Plan of the Sierra Nevada: A Regional Approach to Address Climate Change (Sierra Nevada Conservancy)

This is a regional climate plan developed by the Sierra Nevada Conservancy with direction from the Sierra Nevada Conservancy Governing Board, the secretary of the California Natural Resources Agency, and the governor. It provides a Sierra Nevada perspective and further defines region-specific needs and roles in assessing, mitigating, and adapting to the current and anticipated effects of climate change on the region's ecosystems, habitats, species, and natural and human-made resources and communities. The plan synthesizes information and provides strategies and actions for integrating, supporting, and enhancing existing programs and projects in key areas including water, forest/fire, habitat/biodiversity, biomass, and energy efficiency. The conservancy's Climate Action Plan will integrate and coordinate efforts to create economies of scale, share resources and expertise, and maximize the benefits for the region.

Threat Hazard Identification and Risk Assessment (California Emergency Management Agency)

[Note: Content will be included when Draft Plan is available.]

Water Action Plan (Public Utilities Commission)

The Water Action Plan sets forth the California Public Utilities Commission's (CPUC) policy objectives for the regulation of investor-owned water utilities and highlights the actions the CPUC will take to implement these objectives. The Water Action Plan has four key principles:

1. Safe, high quality water.
2. Highly reliable water supplies.
3. Efficient use of water.
4. Reasonable rates and viable utilities.

Water Boards Strategic Plan 2008-2012 (State Water Resources Control Board)

[Note: The Water-Energy Strategy is currently being updated per the WET-CAT Water-Energy Strategy 2012-2014 (Water-Energy Subgroup of the Climate Action Team).]

In 2008, the State Water Quality Board and the nine Regional Water Quality Boards released an update of their strategic plan. Reflecting the many changes to the environmental regulatory landscape that occurred since publication of the Water Boards 2001 Strategic Plan, the new plan highlights key actions to reduce fragmentation and leverage resource. The plan institutionalizes processes to evaluate consistency and effectiveness continuously of program implementation across the State and Regional Water Quality Boards. Most of the actions of the plan to manage and protect the State's water resources will be implemented within watersheds to eliminate fragmented management approaches. Considering trends and challenges, the Water Boards Strategic Plan Update is designed to support functioning, sustainable watersheds where progress can be measured through environmental goals of healthy surface water and groundwater, and increasing reliance on sustainable water supplies.

CWP Objectives and Related Actions

The objectives and related actions presented in Chapter 8, "Roadmap For Action," are taken, in part, from the featured State agency plans and the various topic caucuses. Many objectives and related actions derived from featured State agency plans were developed to meet various resource management and communication goals.

Table 4-3 shows the featured plans that have content related to the CWP objectives and related actions found in Chapter 8, "Roadmap For Action."

PLACEHOLDER Table 4-3 Matrix of Featured Plans and Related Objectives

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Resource Management Strategies

The featured State plans have multiple connections with the Update 2013 Volume 3, *Resource Management Strategies*. Table 4-4 shows how each featured plan relates to the resource management strategy categories. Several featured plans have crosscutting recommendations, such as the need to both improve water quality and practice resource stewardship.

PLACEHOLDER Table 4-4 Matrix of Featured Plans and Resource Management Strategy Categories

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Implications and Considerations

The new complexities of managing water resources require rigorous, collaborative, and multidisciplinary approaches. The formation of the Tribal Advisory Committee, outreach to federal agencies through joint planning efforts, collaboration with the California Biodiversity Council, and continued expansion of the State Agency Steering Committee furthers better alignment of California's water management. The continued inclusion of featured plans has already paid dividends, as many State agencies are now cross-referencing and engaging the CWP process in creating these plans. Federal agencies are also participating in joint outreach and planning efforts on items of mutual concern. The statewide, broad adoption of IRWM planning has improved collaboration and achieved new insights on ways regions can work together to achieve their goals. Much work remains, but the efforts of the Update 2013 process offers new ways of working together to enhance many existing processes.

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Table 4-1 Special Districts Involved in Some Type of IWM Activity

District Type	Number of Agencies	District Type	Number of Agencies
County Water Districts	166	Reclamation Districts	156
Resource Conservation Districts	96	California Water Districts	136
Irrigation Districts	94	County Sanitation Districts	73
Sanitary Districts	72	Public Utility Districts	54
Storm Water Drainage & Maintenance Districts	49	Water Agency or Authority	30
Flood Control & Water Conservation Districts	48	County Waterworks Districts	28
Municipal Water Districts	37	Drainage Districts	23
Water Conservation Districts	13	Levee Districts	14
Harbor & Port Districts	13	Water Storage Districts	8
Community Services Districts	325 [a]	Municipal Utility Districts	5
Municipal Improvement Districts	5	Sewer District	1
Sanitation & Flood Control Districts	2	Water Replenishment Districts	2
Mosquito Abatement & Vector Control Districts	46 [b]	Metropolitan Water District	1
County Service Areas	895 [c]		

Notes:

[a] This number is likely smaller, as these Districts often provide water, sewer and storm drain services but not always.

[b] These districts are sometimes involved in flood management and water storage issues due to concerns with standing water 3

[c] Only a portion of the service areas provide services

Table 4-2 Key IRWM Events

Year	Event
2002	Integrated Regional Water Management Act encourages local agencies to work cooperatively to manage local and imported water supplies to improve the quality, quantity, and reliability of those supplies.
2002	Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act provides $500,000,000 to fund competitive grants for projects consistent with an adopted IRWM plan.
2005	California Water Plan Update 2005 names IRWM as a key initiative to ensure reliable water supplies.
2006	Proposition 84, the Safe Drinking Water, Water Quality, and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 provide $1,000,000,000 for IRWM planning and implementation.
2006	Proposition 1E, the Disaster Preparedness and Flood Prevention Bond Act of which provides, among other actions, $300,000,000 for storm water projects that reduce flood damage and are consistent with an IRWM plan.
2008	Integrated Regional Water Management Planning Act provides a general definition of an IRWM plan as well as guidance to DWR as to what IRWM program guidelines must contain. Guidelines include standards for identifying a region for the purposes of developing or modifying an IRWM plan.

Table 4-3 Matrix of Featured Plans and Related Objectives

Title	Agency	Water Plan Objectives
2009 California Climate Adaptation Strategy	CNRA	9, 15
2010 Strategic Fire Plan for California	Cal Fire	8
2012 Central Valley Flood Protection Plan	DWR	6, 8, 13, 14, 15
2012 Integrated Energy Policy Report	CEC	2, 9
Alluvial Fan Task Force, Findings and Recommendations Report	AFTF	1, 6, 10, 14, 15, 16
Bay Delta Conservation Plan – Working Draft	BDCP-SC	7
California Agriculture Vision: Strategies for Sustainability	CDFA	2, 5, 9, 15, 16
California Drought Contingency Plan	DWR	2, 8, 10
California Native American Tribal Engagement in the California Water Plan Update 2013 - Tribal Engagement Plan*	TAC	12
California Ocean Protection Council Five-Year Strategic Plan 2012-2017	OPC	5, 10, 15, 16
California Outdoor Recreation Plan 2008	Parks	14
California Forests and Rangelands: 2010 Assessment and 2010 Strategy Report	Cal Fire	5, 11, 16
California Strategic Growth Council Strategic Plan 2012-2014	SGC	10, 14, 15, 16
California's Flood Future: Recommendations for Managing the State's Flood Risk	DWR	6, 8, 14, 15, 16
California's Water Commission Strategic Plan 2012	CWC	7, 12, 16
California Transportation Plan 2025 and 2030	Caltrans	1, 4
California Wildlife Action Plan	CDFW	5, 15
Climate Change Scoping Plan: A Framework for Change	CARB	9
Department of Toxic Substances Control Strategic Plan 2011-2016	DTSC	16
Environmental Goals and Policy Report	OPR	5
Final Draft Delta Plan	DSC	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 14, 16
General Plan Guidelines	OPR	15
Recycled Water Policy	SWRCB	2, 4, 14
Regional Water Quality Control Plans (10 Basin Plans)	SWRCB	4
San Francisco Bay/Sacramento – San Joaquin Delta Estuary Water Quality Control Plan	SWRCB	7
Sierra Nevada Conservancy Strategic Plan	SNC	5, 14
Sierra Nevada Conservancy 2012-13 Action Plan	SNC	5
Small Water System Program Plan	CDPH	13
State Coastal Conservancy Strategic Plan 2013-2018	CCC	5, 14, 16
State of California Emergency Plan	Cal EMA	8, 16
State Multi-Hazard Mitigation Plan	Cal EMA	8, 15
Strategic Plan for the Future of Integrated Regional Water Management	DWR	1
The Climate Action Plan of the Sierra Nevada: A regional Approach to Address Climate Change	SNC	3, 15
Threat Hazard Identification and Risk Assessment	Cal EMA	8
Water Action Plan	CPUC	2, 4, 13, 14, 16
Water Boards Strategic Plan 2008-2012	SWRCB	4

Title	Agency	Water Plan Objectives
WET-CAT Water-Energy Strategy 2012-2014	WET-CAT	9

Source: California Department of Water Resources, 2013

* This is a stakeholder generated plan rather than a State agency plan.

Table 4-4 Matrix of Featured Plans and Resource Management Strategy Categories

Title	Agency	Reduce Water Demand	Improve Operational Efficiency and Transfers	Increase Water Supply	Improve Water Quality	Practice Resource Steward-ship	Improve Flood Mgmt.	People and Water
2009 California Climate Adaptation Strategy	CNRA				X	X		X
2010 Strategic Fire Plan for California	Cal Fire					X		
2012 Central Valley Flood Protection Plan	DWR					X	X	
2012 Integrated Energy Policy Report	CEC	X	X					
Alluvial Fan Task Force, Findings and Recommendations Report	AFTF					X	X	X
Bay Delta Conservation Plan – Working Draft	BDCP-SC		X		X	X		
California Agriculture Vision: Strategies for Sustainability	CDFA	X	X	X	X	X		X
California Drought Contingency Plan	DWR	X	X					
California Native American Tribal Engagement in the CWP Update 2013 – Tribal Engagement Plan	TAC							X
California Ocean Protection Council Five-Year Strategic Plan 2012-2017	OPC	X	X	X	X	X	X	X
California Outdoor Recreation Plan 2008	Parks					X		X
California Forests and Rangelands: 2010 Assessment and 2010 Strategy Report	Cal Fire				X	X		X
California Strategic Growth Council Strategic Plan 2012-2014	SGC					X		X
California's Flood Future: Recommendations for Managing the State's Flood Risk	DWR				X	X	X	X
California's Water Commission Strategic Plan 2012	CWC		X					X
California Transportation Plan 2025 and 2030	Caltrans				X	X		
California Wildlife Action Plan	CDFW				X	X		X
Climate Change Scoping Plan: A Framework for Change	CARB					X		
Department of Toxic Substances Control Strategic Plan 2011-2016	DTSC				X			
Environmental Goals and Policy Report	OPR	X			X	X		
Final Draft Delta Plan	DSC	X	X	X	X	X	X	X

Title	Agency	Reduce Water Demand	Improve Operational Efficiency and Transfers	Increase Water Supply	Improve Water Quality	Practice Resource Steward-ship	Improve Flood Mgmt.	People and Water
General Plan Guidelines	OPR				X	X	X	
Recycled Water Policy	SWRCB	X		X	X			
Regional Water Quality Control Plans (10 Basin Plans)	SWRCB				X	X	X	
San Francisco Bay/Sacramento – San Joaquin Delta Estuary Water Quality Control	SWRCB		X	X	X	X		
Sierra Nevada Conservancy Strategic Plan	SNC					X		X
Sierra Nevada Conservancy 2012-13 Action Plan	SNC					X		X
Small Water System Program Plan	DPH				X			
State Coastal Conservancy Strategic Plan 2013-2018	CCC				X	X	X	X
State of California Emergency Plan	Cal EMA						X	
State Multi-Hazard Mitigation Plan	Cal EMA				X	X	X	X
Strategic Plan for the Future of Integrated Regional Water Management	DWR	X	X	X	X	X	X	X
The Climate Action Plan of the Sierra Nevada: A regional Approach to Address Climate Change	SNC			X	X	X		X
Threat Hazard Identification and Risk Assessment	Cal EMA						X	
Water Action Plan	CPUC	X		X	X			X
Water Boards Strategic Plan 2008-2012	SWRCB	X		X	X	X	X	
WET-CAT Water-Energy Strategy 2012-2014	WET-CAT	X			X			X

Source: California Department of Water Resources 2013

*Additional State and other government plans are referenced in Volume 3, *Resource Management Strategies.*

Figure 4-1 Integrated Regional Water Management Planning Regions Accepted or Conditionally Accepted by DWR as of Publication

Box 4-1 Water Plan State Agency Steering Committee Member Agencies

Air Resources Board
Business, Transportation, and Housing Agency
California Coastal Commission
California Emergency Management Agency (Cal EMA)
California Energy Commission
California Environmental Protection Agency (Cal EPA)
California Public Utilities Commission
California State Board of Food and Agriculture
California Water Commission
Delta Stewardship Council
Department of Boating and Waterways
Department of Conservation
Department of Fish and Wildlife
Department of Food and Agriculture
Department of Forestry and Fire Protection (CALFIRE)
Department of Housing and Community Development
Department of Parks and Recreation
Department of Public Health
Department of Toxic Substances Control
Department of Water Resources
Governor's Office of Planning and Research
Native American Heritage Commission
Natural Resources Agency
Ocean Protection Council
Sierra Nevada Conservancy
State Lands Commission
State Water Resources Control Board
Strategic Growth Council

Box 4-2 Companion State Plans Featured in Update 2013

- 2009 California Climate Adaptation Strategy (California Natural Resources Agency, currently being updated)
- 2010 Strategic Fire Plan for California (Cal Fire 2010)
- 2012 Central Valley Flood Protection Plan (DWR 2012)
- 2012 Integrated Energy Policy Report (California Energy Commission 2012)
- Alluvial Fan Task Force, Findings and Recommendations Report (Alluvial Fan Task Force 2010)
- Bay Delta Conservation Plan – Working Draft (BDCP Steering Committee, currently being developed)
- California Agriculture Vision: Strategies for Sustainability (CDFA 2010)
- California Drought Contingency Plan (DWR 2010)
- California Native American Tribal Engagement in the California Water Plan Update 2013 - Tribal Engagement Plan (Water Plan, Tribal Advisory Committee, Draft Nov 2010)
- California Ocean Protection Council Five-Year Strategic Plan 2012-2017 (OPC)
- California Outdoor Recreation Plan 2008: An Element of the California Outdoor Recreation Planning Program (State Parks 2009)
- California's Forest and Rangelands: 2010 Assessment and 2010 Strategy Report (Cal Fire 2010)
- California Strategic Growth Council Strategic Plan 2012-2014 (California Strategic Growth Council 2012)
- California's Flood Future: Recommendations for Managing the State's Flood Risk (DWR 2013 Draft)
- California's Water Commission Strategic Plan 2012 (California Water Commission 2012)
- California Transportation Plan 2025 (April 2006) and 2030 (Caltrans Oct 2007)
- California Wildlife Action Plan (CDFW 2007)
- Climate Change Scoping Plan: A Framework for Change (California Air Resources Board, currently being updated)
- Department of Toxic Substances Control 2011-2016 Strategic Plan (DTSC)
- Environmental Goals and Policy Report (Governor's Office of Planning and Research, currently being developed)
- Final Draft Delta Plan (Delta Stewardship Council, currently being developed)
- General Plan Guidelines (Governor's Office of Planning and Research, currently being updated)
- Recycled Water Policy (State Water Resources Control Board 2009)
- Regional Water Quality Control Plans (Basin Plans) (Regional Water Quality Control Boards)
- San Francisco Bay/Sacramento – San Joaquin Delta Estuary Water Quality Control Plan (State Water Resources Control Board, currently being updated)
- Sierra Nevada Conservancy Strategic Plan (Sierra Nevada Conservancy 2011)
- Sierra Nevada Conservancy 2012-13 Action Plan (Sierra Nevada Conservancy 2012)
- Small Water System Program Plan (CDPH 2012)
- State Coastal Conservancy Strategic Plan 2013-2018 (California Coastal Conservancy 2012)
- State of California Emergency Plan (Cal EMA 2009)
- State of California Multi-Hazard Mitigation Plan (Cal EMA 2010)
- Strategic Plan for the Future of Integrated Regional Water Management (DWR, currently being developed)
- The Climate Action Plan of the Sierra Nevada: A regional Approach to Address Climate Change (Sierra Nevada Conservancy 2009)
- Threat Hazard Identification and Risk Assessment (Cal EMA, currently being developed)
- Water Action Plan (CPUC 2010)
- Water Boards Strategic Plan 2008-2012 (State Water Resources Control Board 2008)
- WET-CAT Water-Energy Strategy 2012-2014 (WET-CAT 2011)

Chapter 7. Finance Planning Framework — Table of Contents

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Chapter 7. Finance Planning Framework

About This Chapter

California water managers have been directed to provide reliable water supplies, reduce flood risks, increase public safety, help grow the economy, and enhance ecosystems. These same demands have been placed on them with an adage of doing more with less during a time of economic downturn, rising public sector debt, and weakening public support for additional investments. This chapter initiates a process to address challenges in financing the programs and activities outlined in earlier chapters.

Chapter 7 establishes a framework in which multiple requirements, perspectives, and previously non-integrated financing information can be considered. Doing so enables stakeholders, collectively and in context, to consider the issues to be addressed and the decisions to be made. The content in this chapter informs and provides the rationale for the finance objective (Objective 17) and related actions (recommendations) in Chapter 8, "Roadmap For Action." This chapter includes:

- Finance Planning Framework Scope and Process
  - Limitations of the Update 2013 Framework
- Key Facts and Findings
  - Demand for Funding
  - Expenditures and Fund Sources
  - Funding and Institutional Organization
- Framework Components
  - IWM Scope and Outcomes
  - IWM Activities
  - Existing Funding/Expenditures
  - Funding Reliability
  - State Government Role and Partnerships
  - Future Costs
  - Funding, Who and How
  - Trade-Offs
- Next Steps

Finance Planning Framework Scope and Process

This chapter reflects a first step in comprehensive integrated water management (IWM) finance planning from the State government's perspective and goals. It serves to guide State government-funded investments in IWM. The investment scope includes IWM programs and projects directly administered by State government, as well as future State government IWM loans and grants distributed as incentives to regional and local governments. This chapter is not intended to direct regional or local finance decisions, and it does not intend to modify existing State investment frameworks for ongoing financial activities, such as distribution of currently authorized General Obligation (GO) bonds. This chapter, in conjunction with Chapter 8, "A Roadmap For Action," provides a path for resolving issues described below and for filling information gaps as required to support effective State IWM finance solutions.

Several State agencies and stakeholders worked together to develop this Finance Planning Framework (Framework). The Framework provides a logical structure and sequence for financial plan development. This chapter is organized and presented in the same order as the eight components of the Framework. It

begins by describing the scope of IWM, as well as the types of IWM activities that should be considered for funding. It then offers background on how existing infrastructure was financed, along with descriptions of historical federal, State, and local water expenditures since 1985.

Along with Chapter 2, "Imperative to Invest in Innovation and Infrastructure," this chapter reflects initial conversations with stakeholders regarding the role of State government in IWM. These conversations were conducted with regard to the costs associated with all State IWM activities. The Framework includes an estimate of the magnitude of California's investment needs at federal, State, tribal, regional, and local levels. To help decision-makers determine how to meet these investment needs, the Framework provides an assessment of alternatives for future revenue sources. This assessment includes a description of appropriate uses of the revenue sources, any constraints and trade-offs involved in the application of the various sources, and current applications of the sources. (See Table 7-2.) The Framework recognizes the need to strategically invest in the near term to avoid greater costs in the long term (i.e., the concept of avoided costs).

Note that the terms finance and fund tend to be used interchangeably, and often refer to the other in their own definition. *Fund* refers to a supply or stock of money. *Funding* refers to making a supply of money available for a need, program, or project. *Finance* refers to the management of money, which could include such activities as borrowing or developing a revenue stream.

Limitations of the Update 2013 Framework

While the *California Water Plan Update 2013* (Update 2013) Framework provides a cornerstone for stakeholders to work collaboratively through critical funding needs and issues, develop durable finance mechanisms, and identify reliable revenue sources, it is not yet a comprehensive IWM finance plan. A comprehensive State government IWM investment strategy recommends programs and itemizes costs, finance mechanisms, and revenue sources. To that end, several remaining finance planning components must be completed that were not fully developed during Update 2013, owing to limitations of data/information, resources, and/or time. The "Next Steps" section of this chapter outlines actions to adapt, develop, and apply the Framework during California Water Plan Update 2018 and beyond. It also describes the activities, tasks, and deliverables that the Update 2013 staff and advisory groups want included in the Framework. It should be noted that even after developing an IWM finance plan, legislators and the governor must take action to implement such a plan.

Key Facts and Findings

Several striking facts and findings emerged in the development of the Framework. Most significantly, there is no single, easily compiled source of information about current and past IWM investments. This lack of integrated information creates several dilemmas. First, simply discussing finance expenditures often devolves into conflict. Second, stakeholders often operate from completely different sets of information prepared for disparate purposes. In most cases, the information is accurate but sometimes incomplete, drawn out of context, and grounded in fundamentally different assumptions. The reliance on information prepared for specific uses to make broader assumptions is problematic.

The Framework evolved as stakeholders worked together to create a common understanding of California's water financing picture. Using a storyboard format, the goal was to establish a financing baseline and shared meaning about the past and current situation.

The facts and findings developed in this process represent a significant step forward in the comprehensive understanding of complex finance mechanisms that, over time, were created in a fragmented fashion. The sections that follow provide an overview of some of the findings and issues to be considered in implementing the Framework.

Demand for Funding

The status of California's water infrastructure, as well as the demands placed upon it, is of national interest. A number of different sources and estimates on demands for funding have been reported. Even with the variation in numbers among experts, the cumulative total is staggering, as demonstrated by the following examples.

An assessment, conducted by the U.S. Environmental Protection Agency in 2011found that California will need $44.5 billion to fix aging drinking water systems over the next two decades (U.S. Environmental Protection Agency 2013). The survey placed California at the top of a national list of states having major water infrastructure needs. In California and elsewhere, the biggest needs involve repairing and upgrading water transmission and distribution lines.

The American Society of Civil Engineers' (ASCE's) *Infrastructure Report Card for America*, is prepared every four years. Structured as a form of a school report card it assigns letter grades to each type of infrastructure. The 2012 report card gave California a "C" and assigned the following investment needs for water infrastructure (American Society of Civil Engineers 2012):

- Levees/Flood Control — $2.8 billion per year.
- Urban Runoff — $6.7 billion per year.
- Wastewater — $4.5 billion per year.
- Water — $4.6 billion per year.

Other key highlights from the ASCE evaluation indicate California has 807 high-hazard dams and only 45 percent of the State-regulated dams in California have an emergency action plan.

Information gathered in preparation of the report *California's Flood Future: Recommendations for Managing the State's Flood Risk* (California Department of Water Resources and U.S. Army Corps of Engineers 2013) provided significant facts and findings regarding flood risk and requirements for funding.

- $575 billion in structures are at risk in the 500-year floodplains. This does not include economic impacts on families, communities, local businesses, and entire regions when worksites and public facilities are closed as a result of flood damage.
- More than $50 billion in existing needs have been identified for flood management projects, which exceeds available funding sources.

The Bay Delta Conservation Plan (BDCP) is a 50-year ecosystem plan designed to restore fish and wildlife species in the Delta in a way that also protects California's water supplies while minimizing impacts on Delta communities and farms. The total estimated cost of implementing the BDCP, over the 50-year permit term, is approximately $24 billion (California Department of Water Resources 2013).

Expenditures and Funding Sources

Cross-cut budgets for IWM activities are not compiled at most levels of government. This makes completion of a full assessment of actual investment and fund sources difficult. Beyond the wide variation in how different entities prepare budgets, the sheer number of entities involved in providing water-related services makes accurately compiling budget numbers a daunting task. At the local level, the funding complexities are especially difficult to navigate because activities often occur in proximity to one another, many projects serve multiple purposes, and many activities have multiple fund sources.

Local Expenditures

Local entities, such as special districts, water districts, utilities, and cities, account for the largest portion of IWM expenditures, and this is expected to continue for the foreseeable future. Annual local expenditures statewide for 2010 totaled about $18 billion, as shown in Figure 7-3. Even with a significant investment by these agencies in water expenditures, the water management community reports that water projects at all levels of government are commonly underfunded.

The costs of ongoing operations and maintenance (O&M) for existing facilities, along with regulatory costs, consume a large portion of local agency budgets. In addition, local agency budgets are often unable to allocate funds for replacing aging infrastructure.

With limited funding sources and unreliable funding, financing and O&M are ongoing challenges for agencies. Some funding issues include:

- Competition among agencies for resources, such as workforce, grants, and technical assistance.
- Competition with other public demands for resources. For example, flood management agencies are often supported by local agency general funds and must compete with other public demands for such resources as transportation, parks, social services, education, and health services.
- Reductions in property tax revenues.
- Costs associated with permitting and mitigation of projects.
- Lack of resources in small agencies to prepare funding applications. For example, some of the information requested on grant or loan applications is not typically collected by the agency and not quickly developed. Also, smaller agencies might not have the resources to prepare an effective application.

Agencies also have difficulty raising matching funds for federal programs. Many of the agencies require federal or State funds for major capital improvements; however, with limited methods of local revenue generation, many agencies cannot access some of the available federal funds because they cannot raise the required matching funds.

Local agencies have indicated that they are often constrained in fully utilizing existing fund sources by various statutes and restrictions that govern financing considerations, per the following examples:

- Flood management agencies report they have substantial resistance to increasing property assessments, as evidenced by the passage of Propositions 13 and 218. The majority of flood management agencies depend on some type of property assessment as a revenue source; however, the ability to increase or initiate property assessments to satisfy revenue requirements has been restricted for some time in California.
- Agencies that are partially funded through development fees or special projects assessments can be limited by assessment-zone boundaries. These assessment-zone boundaries impose substantial

limitations on the uses of funds. This is important because flooding, water supplies, and water quality are sometimes affected by activities occurring upstream of zone boundaries. In addition, the solution or best management action for providing IWM benefits might be located outside the assessment-zone boundary.

State Funding

State government investments since the turn of the century have been directed to specific purposes (such as to the State Water Project) and used to successfully incentivize local investments in water-related projects.

State government expenditures and fund sources have shifted over time. In recent years, use of the General Fund (general tax base) has decreased and use of publicly financed bonds and special-fund sources have increased. Flexibility in utilizing fund sources is also limited at the State level. For example, several State GO bonds have been authorized since 2001, and State government revenues from special projects and fees have steadily increased from about $1.3 billion in 2001 to $2.7 billion in 2010. Nonetheless, funds for supporting specific IWM activities are not easily adapted to changing IWM priorities. Such funding sources are variable (i.e., annual funding levels) and unpredictable. Existing State bond funding for flood management will be depleted by 2018.

Federal Funding

The amount of funding flowing to the State from the federal government has also changed over time. These changes in fund sources reflect the perspectives and priorities of State and federal elected officials, as well as public perception and priorities for certain types of water-related expenditures. For example, federal investment has historically been the primary source of funding for flood management, but in the context of changing federal priorities such investment is decreasing relative to State government and local investments.

For most agencies, federal funds are becoming scarcer. The U.S. Army Corps of Engineers (USACE) process for identifying federal interest in flood risk-reduction projects has historically emphasized damage-reduction benefits, while placing less emphasis on other project output, such as ecosystem restoration, regional economic development, and other social benefits. With the fiscal issues facing the federal government, most agencies believe that federal funding programs will continue to be reduced, if not eliminated. As an example, the USACE might not continue to fund studies or ongoing projects at the same rate as in the past. Also, funding a large number of studies and projects over long periods is inefficient and results in delayed project development and increases project costs.

Operations, Maintenance, and Environmental Mitigation

While there is often funding for new projects, IWM planning and finance have not adequately covered monitoring, operations, maintenance, and environmental mitigation over the life of a project.

Environmental impacts created long ago, known as legacy impacts, no longer have responsible parties to pay for mitigation.

Debt

California voters, in response to drought and flood, have approved several State GO bonds to fund water projects. Because no additional tax or other revenue stream is created with the issuance of bonds over

time, GO bond debt service has taken an increasing share of California's State budget. California currently allocates about 9 percent of its general fund to total GO bond debt service. Out of the 10 most populous states, California ranks just behind New York for the highest debt-to-personal-income ratio (Office of the State Treasurer 2012).

Total authorized water-related bond debt rose from about $3.8 billion in 1999 to $22.9 billion in 2011, about 20 percent of total bond debt. By comparison, total authorized bond debt across all State government activities rose from $38 billion in 1999 to $128 billion in 2011. On a per capita basis, total GO bond debt rose from $1,130 to over $3,400. (See Table 7-4.)

While California is currently carrying a relatively high level of GO bond debt, debt is not the only metric to plan for or by which economic prosperity should be measured. Borrowing remains a necessary and cost-effective method of financing IWM and many other capital-intensive projects. However, there are risks and costs associated with borrowing that should be fully considered in future financing strategies.

Funding and Institutional Organization

Poor alignment of projects among public agencies affects the ability to fund and deliver efficient and economical multiple-benefit projects. In many cases, related IWM activities, such as water supply, flood, and ecosystem management projects, often in the same location or system, continue to be funded separately.

Overlapping — and sometimes conflicting — responsibilities and priorities among the many regulatory agencies complicate and/or increase the cost of protecting human life, property, economic interests, and the environment. While collaboration among the parties can yield significant benefits, in some cases the agencies are constrained by statutory mandates that prevent innovative solutions and expose the agencies to litigation.

Framework Components

The Framework is a first step toward more fully understanding California's financing picture and finding options to improve the current situation. During the Update 2013 process, a finance storyboard was developed through extensive collaboration with the Public Advisory Committee, Tribal Advisory Committee, Finance Caucus, and other Update 2013 participants. It was developed in response to observations and stakeholder input that there was no common language or understanding of the finance methods and issues across California's geographic regions, IWM strategies, or levels of government (e.g., federal, State, tribal, local). The finance storyboard was the thought process that developed into the Framework described in this chapter.

The purpose of the finance storyboard for Update 2013 and beyond is to provide a framework to organize and describe the suite of issues and methods critical for advancing a statewide IWM finance planning effort. It also provided the structure and the flow of logic required to synthesize a large volume of information and stakeholder input, such that it supports the IWM finance objective (Objective 17) and related actions for State policymakers. This storyboard also provided an approach for the diverse California Water Plan stakeholders and planning partners to discuss and develop a common language and understanding about the role of State government funding and investment in IWM activities.

The Framework is organized into eight components:

1. IWM Scope and Outcomes.
2. IWM Activities.
3. Existing Funding/Expenditures.
4. Funding Reliability.
5. State Government Role and Partnerships.
6. Future IWM Costs.
7. Funding, Who and How.
8. Trade-Off Analysis.

Each component represents a topic that stakeholders and planners felt needs to be part of any statewide IWM finance planning effort. The sequence of the components represents the necessary chronology of the planning effort. For example, it is necessary to define the scope of IWM (component 1) before discussing the State Government Role and Partnerships (component 5). It is also necessary to clarify the role of State government before estimating future funding demand for said role. Note that the traditional finance planning topic of apportioning costs and identifying funding methods does not occur until component 7.

The following sections describe each component of the Framework.

IWM Scope and Outcomes

The purpose of this section is to define the scope of State government's future involvement in IWM activities along with the expected outcomes. While the high-level synthesis of IWM benefits can be captured in the three broad categories of public safety, environmental stewardship, and economic stability, the further refinement of benefit descriptions below is more useful as a tool for determining if an activity is within the scope of IWM. The Finance Caucus approached this by describing the benefits intended to be achieved from the State's investment in IWM. If a proposed activity creates one or more of the benefits described in Table 7-1, it is within the scope of IWM.

PLACEHOLDER-Table 7-1 Benefits within the Scope of IWM

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

IWM Activities

This section describes the types of IWM activities that need to occur to generate the benefits identified in the preceding section. This section defines the scope of activities encompassed in the finance objective and related actions detailed in Chapter 8, "Roadmap For Action." The activities described below represent opportunities to produce desired outcomes. This section describes investment categories to be used for guiding State government IWM investment (i.e., generally, categories of various types of projects or programs) in a way that is relevant to regional project-level activities. These investment categories were developed in response to several key findings that indicated a need to clarify and refine the methods for categorizing State IWM investments.

Categorization of future investments also helps formulate multi-objective, multi-benefit solutions comprised of combinations of the activities described below. Through intensive collaboration with the Update 2013 Finance Caucus, the categories presented below also helped build a common language and improving coordination among diverse bureaucracies. This approach will be useful for aligning funding

and finance planning processes across more than 2,300 federal, State, tribal, and local government entities, each with its own planning processes and scales. For example, local entities tend to plan at the project level while State policy-makers tend to plan at a broader level of investment category.

Two primary categories of investment are innovation and infrastructure, which are further broken down into investment sub-categories. These sub-categories could be used for allocating future State government investments.

Innovation includes actions that improve information, institutional, and technological activities essential for supporting IWM. Innovation categories include:

- **Governance improvements** to promote more coordinated and integrated resources planning among State government agencies and with regional collaboratives and federal agencies.
- **Planning/Public process improvements** to promote and incentivize communication, coordination, and collaboration among water planners/managers, land use planners/decision-makers, and other resource managers at the regional and watershed scale.
- **Strengthening government agency alignment** to improve coordination and consistency among federal, State, tribal, and local government agencies' data/information, plans, programs, policies, and regulations.
- **Information technology improvements** to promote and incentivize water data collection, management, distribution, access, and exchange/sharing, as well as analytical methods.
- **Water technology and science improvements** to advance science, improve and commercialize new water/energy technologies, improve data collection and exchange, and develop analytical tools for IWM.

Infrastructure includes structures and facilities that support human activities (grey infrastructure), as well as naturally occurring assets and services such as wetlands, riparian habitat, and watershed systems (green infrastructure). The categories listed below encompass not only the capital cost of constructing a facility or restoring habitat, but also the long-term operation and maintenance costs that have often been an afterthought to implementation and not adequately financed over their useful life (i.e., the accumulation of significant deferred maintenance and aging infrastructure). Infrastructure categories include:

- **Local and regional projects,** including projects contained in integrated regional water management (IRWM), capital improvement, urban water management, and many other local plans. These plans would include different mixes of the California Water Plan's 30 resource management strategies, depending on the region/location.
- **Inter-regional projects** that would benefit two or more regions.
- **Statewide systems** for water, flood, water quality, ecosystems, and wastewater management that provide statewide benefits.

Existing Funding/Expenditures

This section specifies the levels and sources of recent and current IWM expenditures. It includes a brief summary of historical federal, State, and local expenditures based on the defined scope of IWM. Much more detailed data, metadata, and information on this topic are included in Volume 4, *Reference Guide*.

Historical Overview

Historically, funding for water management in California has been provided by a combination of federal, State, and local agencies. Figure 7-1 shows the general historical spending and funding eras over the past

160 years, using broad categories. Starting with the Gold Rush, initial major infrastructure was put in place to bring land into production. Over the next several decades, multipurpose infrastructure projects were built. In the latter decades of the 1900s, investment shifted to include environmental protection projects. Shifts in financing eras are a result of major events, natural and human, and are generally reactive in nature. This past decade has seen several State bonds passed for infrastructure purposes, including flood management, as well as significant federal funding. More information on historical funding can be found in Chapter 3 and in Volume 4, *Reference Guide*.

PLACEHOLDER Figure 7-1 History of Funding for Water Management in California

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Local, State, and Federal Expenditures, 1995-2010

Figure 7-2 illustrates the average proportion of water management expenditures by local, State, and federal agencies between 1995 and 2010. Local agencies account for the largest portion of expenditures, averaging $14.6 billion per year, followed by State agencies at $1.9 billion and federal agencies at $805 million per year. Expenditures vary over time, depending on factors such as State and federal appropriations and bond measures.

PLACEHOLDER Figure 7-2 Recent Annual Expenditures on Water Management in California, 1995-2010

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Figures 7-2 and 7-3 show that local agencies are responsible for the majority of the total expenditures. Between 1995 and 2010, annual project expenditures for water management in California ranged from approximately $12.5 billion to $21.7 billion, as shown in Figure 7-3. This figure shows total expenditures for IWM in California by local, State, and federal agencies. Local expenditures include water management activities by city, county, and special districts. State-level expenditures include water management activities in the Natural Resources Agency and California Environmental Protection Agency and general government. Federal expenditures include water management activities in California by federal agencies. Between 1995 and 2010, there were significant short-term bond infusions of funding for specific State projects. In Fiscal Year 2008-2009, federal expenditures had a one-time increase for shovel-ready projects owing to the passage of American Recovery and Reinvestment Act.

PLACEHOLDER Figure 7-3 Recent Trends in Local, State, and Federal IWM Expenditures (in millions), 1995–2010.

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Funding Reliability

This section provides a high-level description and qualitative summary of funding sources for IWM currently being used or that have been proposed in the past, and the role of State government bonds. More information on this topic can be found in Chapter 2, “Imperative to Invest in Innovation and Infrastructure.”

The future of water financing in California remains uncertain. Water management strategies are being integrated, but water management funding is still fragmented, thus limiting opportunities for further investment in water innovation and both green and grey infrastructure. Future financing mechanisms will need to capitalize on federal, State, tribal, regional, local, public, and private cost-sharing. Even with further integration, securing adequate funding will require innovative financing mechanisms, such as those used for other public infrastructure (e.g., transportation).

There is no single approach, mechanism, or revenue source for developing a reliable funding portfolio for IWM. Reliable funding will be driven by State, regional, and local interests, and solutions will need to be considered at a regional and/or local scale.

The financing mechanisms and revenue sources described below are presented in Update 2013 as an inventory of tools for advancing IWM activities and programs.

Funding Mechanisms and Revenue Sources

System capital improvements and ongoing O&M costs are typically financed with cash-on-hand or by issuing debt. Cash financing is often supported by user fees or taxes that support a general fund. User fees include volume-usage charges and service fees that typically are fixed, such as residential connection charges. Cash is typically used to pay for O&M costs, while larger capital project costs are primarily financed by issuing debt. Debt financing includes various types of bonds, ranging from GO bonds, which are backed by the General Fund, to builder revenue bonds, which are backed by special assessment districts. Access to different types of capital markets varies across State government and local agencies.

Federal finance strategies usually involve the federal treasury and finance water management projects selected based on benefit-cost analyses. Direct project beneficiaries reimburse the costs through user fees. For example, Central Valley Project (CVP) water supply contractors pay for water deliveries that finance CVP costs.

State government uses bonds to finance new water-management capital projects, including GO bonds and revenue bonds. GO bonds are backed by the taxing power of the State government and are paid off from the General Fund with interest. Financing for water infrastructure by State government has increasingly relied on GO bonds in recent years. GO bonds provide an infusion of capital to finance construction but may not adequately provide for O&M or ongoing repair costs. State government also uses lease-revenue bonds, which are similar to GO bonds but are not backed by the General Fund and do not require voter approval. Revenue bonds are not supported by the General Fund and are repaid by another revenue stream, typically user fees. (See Box 7-1 for a description of taxes versus fees.)

PLACEHOLDER Box 7-1 Taxes vs. Fees

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Local agencies primarily finance water management projects with revenue bonds. Revenue bonds carry a higher interest cost than GO bonds. Some projects are financed by local GO bonds backed by local property taxes, although this is less common because of the two-thirds voting requirements from Proposition 218. Local agencies additionally have access to state revolving fund (loan) programs and

state-funded local assistance grants. These typically involve cost-sharing between local and state government agencies.

Table 7-2 summarizes water management revenue sources that have been used or considered by State government and local agencies. Their appropriate uses, feasibility, key trade-offs, and applicability in California for these revenue sources are also described in Table 7-2.

PLACEHOLDER Table 7-2 State and Local Water Management Revenue Sources

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Federal Revenue Sources

Besides the annual contributions that federal government makes to the Clean Water and Drinking Water State Revolving Funds, several federal revenue sources could provide funding for California IWM. Depending on actions by Congress, funding may be available to the State or local governments. One of the most significant contributors of federal funds over the past few decades has been the Water Resources Development Act.

Water Resources Development Act

The Water Resources Development Act (WRDA) refers to a series of public laws enacted by Congress to deal with a range of water resources issues. The first WRDA, passed in 1974 (Public Law 93-251), amended the Flood Control Act of 1954 and authorized the USACE to undertake projects with additional purposes, such as navigation. There have been 10 WDRAs passed since 1974, with the latest passed in 2007. Over the years, it has been expanded to consider other purposes, such as ecosystem improvements, water resources development, and water conservation.

Congress is currently considering a 2013 WRDA introduced in May. As it is currently written, the legislation would establish a 5-year innovative project financing pilot program. This new pilot program would provide loans and loan guarantees for important flood management, water supply, and wastewater projects.

PLACEHOLDER Box 7-2 Federal Funding Sources

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

California General Obligation Water Bonds

This section summarizes data for California water bonds issued between 1970 and present, and other GO bond debt, including schools and other infrastructure, to place the level of water bond debt into context. The intent of this section is to capture what is currently referred to as IWM, which includes water supply, water quality, ecosystem, and flood-management bonds. These water-related bonds have made up a larger portion of total bond debt in recent years. The trend shows an increase in GO bond financing of water projects as a portion of total GO bonds. Revenue bonds are also an important source of financing for capital projects, which are not supported by the General Fund and are generally used by local agencies, though they are not discussed in this section summary.

Table 7-3 summarizes water management-related bonds that were passed in California. In 2010 dollars, a total of $32.4 billion in water bonds have been approved in California since 1970. Of this total, $23.2 billion, or 71 percent, of the water bonds were passed since 2000. This shows the pronounced increased reliance on bonds for financing water infrastructure. On California's total GO bond debt of $127.6 billion, the debt service is currently about 9 percent of the General Fund (see Table 7-4).

PLACEHOLDER Table 7-3 California General Obligation Water Bonds from 1970 to Present

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

State GO bonds have become an important source of IWM funding. GO bonds are a fluctuating revenue source because of the intermittent nature of bond approval and sales, making them a somewhat unpredictable and unreliable revenue source for water projects. Table 7-4 shows total authorized state GO bonds as of 1999, 2005, and 2011. Total water bonds were $3.8 billion in 1999, accounting for approximately 10 percent of total authorized State bonds; and increased to $22.9 billion by 2011, or 18 percent of total authorized bonds, largely as a result of Propositions 1E and 84. Currently authorized water-related GO bonds are expected to be fully allocated by 2018.

PLACEHOLDER Table 7-4 Total Authorized GO Bond Debt in California (in billions)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Figure 7-4 shows that funding for IWM projects has gradually increased as a portion of total bond funding — 10 percent of the total in 1999 to 18 percent by 2011.

PLACEHOLDER Figure 7-4 Total Authorized State General Obligation Bonds in California

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Figure 7-5 illustrates outstanding GO bond funding for water-related activities over time. Authorized GO bonds and federal funding accounted for approximately two-thirds of total water management expenditures in FY 2012. In recent years, State bond funds have become a larger portion of total water-related investments in California, as federal expenditures have stayed the same or decreased. Annual debt service for outstanding water bonds is approaching $80 per household because water bonds make up a larger proportion of water funding. By comparison, when distributed equally among all households in the state, the total annual debt service amounts to $365 per household (see Volume 4, *Reference Guide*, the article "[under development].").

PLACEHOLDER Figure 7-5 General Obligation Water Bond History, 1970-2012

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

State Government Role and Partnerships

This section summarizes the current and future role of State government to support and advance IWM regionally and statewide. It includes a description of current and future State government obligations and commitments, as well as of its role in investing in IWM innovation and infrastructure. A more detailed

description of State government's role can be found in Chapter 2, "Imperative to Invest in Innovation and Infrastructure."

In the history of water development in California, the role of federal and State governments has been demonstrated by their investments in water and flood management infrastructure to promote growth and economic development in rural, suburban, and urban communities. These investments resulted in major projects that crossed watersheds and/or had broad-based public benefits. During the past few decades, government's role has also included environmental protection and enhancement. More recently, State government is promoting multi-benefit IWM programs and projects with more sustainable outcomes, and ensuring that disadvantaged communities have safe water and sanitation. (Refer to the "Shared Values for State Government Investment and Prioritization" section of this chapter.)

Basic Obligations

The obligations of State government include:

- **Representing California in government-to-government interactions** with the federal government, other states, and other sovereign nations and tribal governments.
- **Meeting basic public health and safety needs for all Californians** by regulating minimum public health standards and by providing assistance to communities that are unable to meet regulations.
- **Protecting public trust resources** by regulation and in planning and allocation of water resources. The public trust doctrine recognizes that certain natural resources, including water, tide and submerged lands, the beds and banks of navigable rivers, and fish and wildlife resources are owned by the public and held in trust for present and future generations of Californians.
- **Protecting unique real property interests**. The State has a fundamental responsibility to California taxpayers to protect the real property assets owned by the State and reduce State liabilities.

Commitments and Responsibilities

- **Operate and manage the State Water Project.** State government is the owner and operator of the State Water Project (SWP) and has the responsibility (and contractual commitments) to provide reliable water supplies to the water contractors, the financiers and beneficiaries of the SWP.
- **Plan, implement, and maintain the State Plan of Flood Control.** State government has responsibility for providing assurances to construction access, operations, and maintenance for portions of the State's federally authorized flood protection system.
- **Planning, policy research and technical assistance.** State government performs many critical planning and research activities in support of resource management (executive, legislative, and local government) decisions and advancing water science and technology**.**
- **Integrate water rights and water quality planning.** Basin plans are prepared for each of the 10 hydrologic regions and by statute become part of the California Water Plan.

Investing in Innovation and Infrastructure

State government has and should take a leading role in investing in innovation and infrastructure actions for the benefit of all regions. Innovation includes a broad range of activities that comprises governance, planning, and process improvements; data; tools; and water technology research and development. State government can also demonstrate leadership by serving as a facilitator and clearinghouse of innovation to

ensure that new solutions are fully utilized throughout the state. The State's investment in innovation provides processes and information that aid decision-making throughout the state and support more cost-effective infrastructure investments by regional and local entities.

State government has and should continue to invest in water infrastructure — natural (green) and built (grey) — in partnership with federal, tribal, regional, and local governments; non-profit organizations; the business community; and private entities.

State government investments should focus on actions that:

- Regions and communities cannot accomplish on their own.
- Involve interregional, interstate, or international issues.
- State government can do more efficiently and/or cost-effectively (i.e., providing a high return on investment to the benefit of the state's taxpayers).
- Provide broad public benefits.
- Remediate legacy environmental impacts.

Future IWM Costs

This section summarizes anticipated total future IWM costs throughout California and across federal, State, tribal, and local governments. Owing to many data gaps and lack of a consistent methodology, Update 2013 includes a preliminary and cursory estimate of future IWM costs. Additional engineering, economic, and risk characterization studies are needed to develop more accurate projections of California's future IWM funding needs (see the "Next Steps" section, below). That said, based on recent and existing IWM expenditures and a reasonable assumption of needed near-term innovation and infrastructure, it is estimated that at least $200 billion is needed over the next decade. This estimate assumes that future average annual IWM expenditures over the next 10 years would occur at approximately the same rate as current annual expenditures ($20 billion per year as shown in Figure 7-3). Because authorized GO bonds are almost fully allocated, and federal and State general fund IWM allocations are declining, new finance mechanisms and revenue sources will be needed to sustain current annual expenditure levels. The majority of all IWM investments in California during the next decade will go toward meeting infrastructure needs. A smaller but important portion will go toward innovation to increase return on IWM investments.

The estimate of $200 billion needed for innovation and infrastructure over the next decade encompasses federal, State, and local investments. Local entities will pay the majority of these costs. State government investment in innovation will be only a small portion of this estimate, perhaps less than a few hundred million dollars. State government investment in infrastructure, including financial incentives and cost-sharing with federal, local, and private partners, will depend on future authorizations, funding mechanisms, and revenue sources (as described in the "Funding Mechanisms and Revenue Sources" section, above).

The California Flood Future Report identified more than $50 billion in needs for specific projects and improvements that are now in the planning cycle. These projects (mostly site specific) collectively would not provide statewide protection from the 100-year storm event. The total investment needed to reduce risk against the 500-year flood event is assumed to be several times the $50 billion amount. This is based on the 5.8-million increase in population exposed within the 500-year floodplains, compared with 1.4 million in the 100-year floodplain. Despite this risk, willingness to fund flood management for a 500-year storm event has not been demonstrated. For this reason, a conservative estimate for flood

management investments, based on what Californians would be willing to accept and pay for, could be at least twice the $50-billion estimate for existing proposed projects, or more than $100 billion.

As previously mentioned, ASCE's 2012 *Infrastructure Report Card for America* gave California a "C" and assigned the following investment needs for water infrastructure:

- Levees/Flood Control — $2.8 billion per year.
- Urban Runoff — $6.7 billion per year.
- Wastewater — $4.5 billion per year.
- Water — $4.6 billion per year.

An assessment, conducted by the U.S. Environmental Protection Agency in 2011 found California could use $44.5 billion to fix aging drinking-water systems over the next two decades (U.S. Environmental Protection Agency 2013). The survey placed California at the top of a national list of water infrastructure needs. In California and elsewhere, the biggest need was for repairing and upgrading water transmission and distribution lines.

The BDCP is a 50-year ecosystem plan designed to restore fish and wildlife species in the Delta in a way that also protects California's water supplies while minimizing impacts on Delta communities and farms. The total estimated cost of implementing the BDCP, over the 50-year permit term, is approximately $24 billion (California Department of Water Resources 2013).

As another estimate of future IWM costs, there are approximately 10,000 water projects identified by the state's 48 IRWM regional water management groups. Although it is unlikely that every project would be implemented, the total cost of these projects would be several hundred billion dollars.

Funding, Who and How

This section frames the discussion for future IWM financing mechanisms and revenue sources. It describes shared values for guiding State government investments and prioritization, how to allocate State government funding, and desired attributes of future financing mechanisms and revenue sources. More information can be found in Chapter 2, "Imperative to Invest in Innovation and Infrastructure," and in Volume 4, *Reference Guide*.

Shared Values for State Government Investment and Prioritization

An essential first step completed during Update 2013 was identifying shared values to guide decisions related to the Framework. The shared values described below are intended to guide IWM decisions regarding investment and prioritization of State government funds. The scope includes IWM programs and projects directly administered by State government, as well as future State IWM loans and grants that are allocated as incentives to tribal, regional, and local governments. These values can also guide preparation of future criteria for State government funding. These values are not intended to direct tribal, regional, or local finance decisions, and they are not intended to modify existing State investments or ongoing financial activities, such as the allocation of currently authorized GO bonds. The shared values are also not intended to provide guidance for financing of specific projects at any scale (statewide, inter-regional, regional, tribal, or local).

The shared values developed for Update 2013 are grouped into three categories: Prioritization of State Government Investments, Fiduciary Responsibility, and Beneficiary and Stressor Responsibility.

Prioritization of State Government Investments — Investment decisions will include equal regard for economic, environmental, and social criteria.

- Decisions are informed and priorities are set using a process that includes broad stakeholder interests and public participation.
- Preference is given to multi-benefit projects that meet regional or statewide interests.
- Cost and benefit data used in the analysis include monetary and nonmonetary life-cycle costs and benefits with an emphasis on long-term planning. Stranded costs are avoided, and all costs during the life of a project are included in the analysis, such as monitoring, planning, construction, operation, maintenance, mitigation, business disruptions, and externalities.
- Decisions are made using best available data and knowledge, understanding that deferring decisions in anticipation of better information can increase cost of implementation, create hesitation, and miss opportunities to achieve benefits.

Fiduciary Responsibility — State government will be fiscally responsible with State funding.

- Investment decisions account for the availability of future revenues, cost of borrowing, and risks of indebtedness. This includes matching investments with appropriate funding mechanisms and revenue sources.
- Good stewardship of State government funds includes transparency, accountability, discipline to spend reasonably, clarity of purpose, and personal integrity by those entrusted with public funding. Good stewardship engenders trust and increases the public's willingness to pay for future IWM activities.
- State government funding is not redirected from its authorized purpose.
- Amount of time needed to repay debt does not exceed the life of a project. This value applies to fiscal, natural, and all other emergencies.

Beneficiary and Stressor Responsibilities — Those receiving benefits or creating impacts pay for them.

- When beneficiaries can be identified, those receiving benefits pay for them. A nexus and proportionality is established between charges and benefits. This value recognizes the concept of equity regarding value exchange (i.e., paying in proportion to what you receive).
- State government has a responsibility to help communities that cannot help themselves. State funding is also appropriate for helping communities meet State regulations that they cannot fully cover.
- State funding pays for broad statewide benefits.
- State government pays for persistent impacts from historical activities that are no longer creating impacts of the same type or magnitude (legacy impacts), but only in cases where stressors cannot be identified or no longer exist. In some cases, legacy impacts may go unaddressed indefinitely.
- State funding is proportional to the broad public interest. Assignment of costs to entities that currently engage in an activity that involves an area affected by legacy impacts is limited to the entities' current impacts (not legacy impacts). Some legacy impacts may need to be addressed before costs are assigned.

Attributes to Frame Future Deliberations

Update 2013 discusses better organizational alignment of State agencies as a way to expedite implementation of IWM activities and reduce the cost of delivering IWM benefits. (See Chapter 4,

"Strengthening Government Alignment," for more details.) One way to improve State government IWM finance is through a more coordinated and consistent funding approach across State government. Such an approach could also provide an opportunity to implement several components of the Framework and advance the shared values for State government investment and prioritization. A coordinated funding approach needs to be designed to increase return on investment, enhance accountability, and improve consistency and efficiency. Other goals for new approaches include allocating State dollars to leverage federal and private funding, increase local flexibility to reflect local and regional conditions, and to advance regional goals and investment priorities with grants and loans. Future deliberations should include, but are not limited to, the following attributes:

- Funding mechanisms that provide a consistent financing framework for State government investments in IWM and achieve the following:
  - Improve cost effectiveness, efficiencies, and accountability.
  - Avoid stranded costs and funding discontinuity.
  - Leverage funding across State government agencies.
  - Increase certainty of desired outcomes.
- Prioritization based on shared funding values, defined principles, goals, objectives, and criteria.
- Prioritization method and rationale for apportioning IWM investment by the categories and subcategories developed in the Update 2013 Framework (i.e., innovation and infrastructure).
- Methods for enhancing stewardship of State government monies at both statewide and regional scales, including strategies to improve the transparency and accountability of State fund disbursements.

Trade-Off Analysis

This section outlines a proposal to develop a decision support system to examine funding scenarios and help analyze trade-offs. More information can be found in Chapter 6 and Volume 4, *Reference Guide*.

California faces tough decisions and trade-offs to allocate increasingly scarce funds to support IWM. Water management must compete for financial resources with a myriad of other infrastructure demands. When investment needs exceed existing available funding levels, it becomes increasingly important for decision-makers to prioritize new water projects while accounting for the trade-offs.

IWM decisions typically involve some type of collaborative process. The decision process can be characterized by two fundamental components, decision support and decision-making. Decision support involves consideration of the entire system and how (or if) a potential project fits within existing infrastructure and policies. Decision-making requires additional information, such as selection criteria, availability of funds, and project costs and benefits. The decision-making process typically results in some type of ranking of alternatives, whereas the decision support process evaluates how a project fits within a system.

A consistent and understandable framework for displaying important costs, benefits, and other impacts of potential projects can help inform these decisions. A Decision Support System (DSS) is a general term for a computer-based approach to provide structured and consistent information for decision-making. When options are numerous, interrelated, and have complex effects, decision-makers need to be able to screen the options, eliminate those that clearly do not meet the project goals and criteria, and identify a smaller number of scenarios that warrant further consideration and analysis. Both the screening step and the detailed analysis step can be greatly assisted by a DSS.

Next Steps

This section proposes actions to adapt, develop, and apply the Framework during Update 2018 and beyond. It describes many activities, tasks, and deliverables that the Update 2013 staff and advisory groups want included in the Framework but were not completed during the Update 2013 process. In addition to the actions below to improve the Framework, Chapter 8, "Roadmap For Action," contains a finance objective together with several related actions to improve the financing of IWM activities in California.

While the Framework is intended to guide decisions on state government funding, there is value in considering the Framework as a tool for identifying and sequencing all relevant finance planning activities at any level of government. Future water plan updates will continue to advance and refine the Framework. Future work is expected to consider each component (as developed by the Finance Caucus for the Finance Storyboard) of the Framework in the following ways:

- **IWM Scope and Outcomes (Component 1)** — Revisit, clarify, and adapt the scope of IWM to changing conditions and priorities.
- **IWM Activities (Component 2)** — Develop more specificity regarding the types of activities that State government should invest in with a clearer nexus to the types of anticipated benefits.
- **Existing Funding (Component 3)** — Continue to compile and synthesize data that tracks historical water-related expenditures across local, State, and federal governments in California.
- **Funding Reliability (Component 4)** — Work with the State Agency Steering Committee to identify where potential funding gaps exist between the State IWM activities described in component 2 and existing funding levels and sources. Collaborate with regional water management groups to do the same for local and regional IWM activities.
- **State Role and Partnerships (Component 5)** — Continue to clarify and elaborate on the future role of State government to support a more specific description and estimate of future costs.
- **Future Costs (Component 6)** — Estimate future funding demands by (a) launching IRWM, city, county, and special-district data pull, and (b) working with the State Agency Steering Committee to estimate the funding demand for existing and future IWM activities.
- **Funding, Who and How (Component 7)** — Continue to collaborate with stakeholders and federal, State, tribal, and local governments to investigate and develop finance mechanisms and revenue sources that address the facts and findings detailed in this chapter. Future deliberations should include, but are not limited to, the following attributes:
    - Funding mechanisms that provide a consistent financing framework for State government investments in IWM and achieve the following:
        - Improve cost effectiveness, efficiencies, and accountability.
        - Avoid stranded costs and funding discontinuity.
        - Leverage funding across State government agencies.
        - Increase certainty of desired outcomes.
    - Prioritization based on shared funding values, defined principles, goals, objectives, and criteria.
    - Prioritization method and rationale for apportioning IWM investment by the categories and subcategories developed in the Update 2013 Framework (i.e., innovation and infrastructure).
    - Methods for enhancing stewardship of State government monies at both statewide and regional scales, including strategies to improve the transparency and accountability of State fund disbursements.

- **Trade-Off Analysis (Component 8)** — State government should develop a DSS to provide guidance and leadership for defining uncertainties of future cost, benefits, prioritization, and other trade-offs. The DSS would inform prioritization of State government expenditures, estimation of expected IWM benefits, and methods for apportioning costs across financiers. It also includes developing a clear and consistent methodology for identifying public benefits associated with the entire range of IWM activities.

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Table 7-1 Benefits within the Scope of IWM

IWM Benefit Type	Definition
Affordability	Occurrence of water supplies of sufficient quality, certainty and cost to enhance or serve disadvantaged communities, sustain diverse portfolios existing and future of economic activities as well as achieve water costs that enable, at a minimum, current levels of standard of living.
Drought Damage Reduction	The magnitude and probability of economic, social or environmental consequences that would occur as a result of a sustained drought.
Energy	Efficient use, or increases in production/recovery of, energy associated with managed and unmanaged water use, storage, treatment, distribution and/or reuse.
Environmental	Preservation or restoration of the fish, wildlife, natural processes/functions, habitat and other aquatic resources for the continued viability of natural heritage, self-sustaining ecosystems and/or biodiversity. (e.g. recovery of sensitive species, control of invasive species, adequate water supply and quality)
Flood Damage Reduction	Reduce the adverse impacts of floods to human and natural systems through a portfolio of structural and non-structural measures that address their vulnerability, exposure and recovery during flood events. This includes pre-flood planning and hazard mitigation, emergency preparedness and response activities, and post-event repairs (including environmental infrastructure repairs).
Food Security	Adequate reliability, affordability, and supply of water, land and other natural resources to reliability to support domestic production of food, fiber, livestock, and other farm products to meet current and forecasted consumer demands.
Fuel Load Management	Fuel reduction involving the modification of vegetation in order to reduce potential fire threat, reduce the risk of high severity wildfires thereby; (1) preserving water quality and natural water treatment processes within watersheds; (2) avoidance of downstream sedimentation impacts on water supply; and/or (3) improve wildlife habitat capability, timber growth, or forage production.
Groundwater Overdraft Reduction	Avoidance of the condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years during which water supply conditions approximate average conditions.
Operational Flexibility and Efficiency	Optimization of existing legal, operational and management procedures for (and/or physical modifications to) existing water management faculties to improve the efficiency of existing water operations or uses (e.g., irrigation)
Reduce Climate Change Impacts	Development and implementation of strategies that improve resiliency, reduce risk, and increase sustainability for water and flood management systems and the ecosystems upon which they depend.
Water Dependent Recreational Opportunity	Opportunities for water-dependent recreation for California's residents, communities and visitors now and into the future (e.g. skiing, fishing, kayaking, etc)
Water Quality	Chemical, physical, and biological characteristics of water, usually in regard to its suitability for a particular purpose or beneficial use for the enhancement or preservation of public and environmental health
Water Supply and Supply Reliability	Occurrence of water supplies of sufficient quality and certainty to enhance or sustain and grow current types and levels economic activities, ecosystem health and maintain quality of life

Table 7-2 State and Local Water Management Revenue Sources

Revenue Source	Appropriate Uses	Feasibility	Key Tradeoffs	Application in California
General Fund	Activities that benefit the general public	Available each year, but subject to competing uses	Funds are limited	A common source of funding
General Obligation Bonds	Projects that benefit the general public	Commonly used	Subject to a vote	Commonly used, but some concern about getting future bonds approved
Revenue Bonds	Projects where a dependable revenue stream is available	A standard method of financing	None	A typical method of financing for local and state projects
User Fees	Projects where direct beneficiaries are easily identified.	Potentially works well with clearly defined beneficiaries, less likely to work for projects with significant public benefits.	Will focus projects to those with local scope which may undermine IWM efforts. May limit state's ability to increase fees and taxes to support other projects.	State Water Project is an excellent example as over 90% of project cost will be repaid by direct beneficiaries (contractors)
Assessment Districts	Can be formed by majority vote but must support local projects that do not provide a "general" public benefit. Water and storm water projects are generally allowed under assessment districts.	The state could coordinate with local agencies to establish assessment districts.	Assessment districts cannot be used to support general public benefits and, as such, will tend to focus on local projects.	1911 and 1913/1915 assessment districts are widely used by local agencies in California.
Utility User Tax	Earmarked for a special purpose or used as a general tax	Used by many cities and a few counties	Has to be approved by a ballot measure.	Widely used by cities
Impact Fees	Used by local governments to charge new development for the additional cost imposed on existing public infrastructure.	Impact fees are generally used in over 90% of local governments in California, thus there is limited opportunities for further expansion.	Deters new development.	Widely used in California
Statewide Water Use Fee (Proposed in 2006 and 2011)	Would have been used for state water management activities	Failed to move forward in 2006 and 2011	Could impact local agencies ability to generate local revenues	Would require a vote

Revenue Source	Appropriate Uses	Feasibility	Key Tradeoffs	Application in California
Public Goods Charge	Could fund a variety of IWM activities	Was approved for electricity but sunset in 2011. Never has been tried with water.	Could impact local agencies ability to generate local revenues	Not yet tried in California, would need a two-thirds vote
Mello-Roos Special Taxes	Areas with new development. It is possible to establish Community Facility Districts (CFDs) in other areas, but this requires a majority vote by residents to tax themselves.	CFDs are most feasible during strong housing markets when there is significant new development.	When housing markets and development slows, forming additional CFDs is difficult and there may be concerns with revenues to pay back existing bonds.	Recently used to finance the Bear River Levee Setback project in Yuba County
Private Investors	Local water projects that generate revenue	Typically have been used as part of design-build process	Interest rates are higher than public debt, can't be used on state projects	Limited to local projects
Private-Philanthropic	Traditionally has been used for ecosystem projects	Commonly used	Not a predictable revenue source	Widely used in California

Table 7-3 California General Obligation Water Bonds from 1970 to Present

Year	Title	Base Amount (millions)	In 2010 Dollars (millions)
1970	Clean Water Bond Law of 1970 (Prop. 1)	250	1,504
1974	Clean Water Bond Law of 1974 (Prop. 2)	250	1,028
1976	California Safe Drinking Water Bond Law of 1976 (Prop. 3)	175	606
1978	Clean Water and Water Conservation Bond Law of 1978 (Prop. 2)	375	1,123
1982	Lake Tahoe Acquisitions Bond Act (Prop. 4)	85	185
1984	California Safe Drinking Water Bond Law of 1984 (Prop. 25)	75	150
1984	Clean Water Bond Law of 1984 (Prop. 28)	325	651
1984	Fish and Wildlife Habitat Enhancement Act of 1984 (Prop. 19)	85	170
1986	Water Conservation and Water Quality Bond Law of 1986 (Prop. 44)	150	290
1986	California Safe Drinking Water Bond Law of 1986 (Prop. 55)	100	193
1988	California Safe Drinking Water Bond Law of 1988 (Prop. 81)	75	138
1988	California Wildlife, Coastal, and Park Land Conservation Act (Prop. 70)	776	1,427
1988	Water Conservation Bond Law of 1988 (Prop. 82)	60	110
1988	Clean Water and Water Reclamation Bond Law of 1988 (Prop. 83)	65	120
1996	Safe, Clean, Reliable Water Supply Act (Prop. 204)	995	1,471
2000	Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act (Prop. 13)	1,970	2,632
2000	Safe Neighborhood Parks, Clean Water, Clean Air, and Coastal Protection Bond Act of 2000 (Prop. 12)	2,100	2,805
2002	California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002 (Prop. 40)	2,600	3,305
2002	Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Prop. 50)	3,440	4,372
2006	Disaster Preparedness and Flood Protection Bond Act of 2006 (Prop. 1E)	4,090	4,385
2006	Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Prop. 84)	5,388	5,777

Table 7-4 Total Authorized General Obligation Bond Debt in California (in billions)

Category	1999	2005	2011
Miscellaneous	1.7	2.5	3.3
Correctional	4.1	4.1	2.8
Total Water Bonds	**3.8**	**14.0**	**22.9**
Transportation	5.6	7.2	40.0
Education	22.4	51.1	58.6
Total	**37.7**	**78.9**	**127.6**
Per Capita	1,127.2	2,191.9	3,407.9

Source: State of California 2010

Figure 7-1 History of Funding for Water Management in California

Theme of Era				
Development and Growth	Federal Investment	Infrastructure Expansion	Water Resources Development / Protection	Current State Bond Funding
Significant Actions				
• Construction of dams, canals and levees for transportation, agriculture and water supply occurred throughout this period in the Central Valley, Bay Area and, most notably, in the Sac/S.J. Delta	• Central Valley Project • USACE and Bureau of Reclamation involvement in water conservation, water supply, flood management, and wildlife protection projects	• State water project constructed • National Flood Insurance Act of 1968 • Continued flood infrastructure development	• Water Resources Development Act passed (1974, 1976, 1986, 1988, 1990, 1992, 1996, 1999, 2000, 2007) • State and Federal environmental laws enacted (Clean Water Act, Endangered Species Act, California Endangered Species Act California Environmental Quality Act)	• State bond funded infrastructure improvements, planning and emergency management preparedness projects
Financing Mechanisms				
• Levee construction by land owners and reclamation districts • Federal funding of flood control projects (e.g. Los Angeles River and, Sacramento River Flood Control Project)	• Flood Control Act of 1928 – Authorized the USACE to construct projects on the Sacramento River for flood control • Flood Control Act of 1944 authorized the Lower San Joaquin River & Tributaries Project	• General obligation bonds for State Water Project • Utility rates, revenue bonds ,and fees fund local agency projects • 1973 statute required local and State cost sharing of projects (Senate Bill 399 Sec 12585.2 of the California Water Code, Amended in 1973 (Chapters 893))	• Clean Water Act funds variety of Federally authorized projects • 1973 Way Bill (California Water Code §12980-12991) set requirements for State funding of non-project levee maintenance and improvement costs	• Passage of several Propositions with IWM components •Prop 13 •Prop 12 •Prop 40 •Prop 50 •Prop 1E •Prop 84 •2014 Bond (potential)

Figure 7-2 Recent Annual Expenditures on Water Management in California, 1995-2010

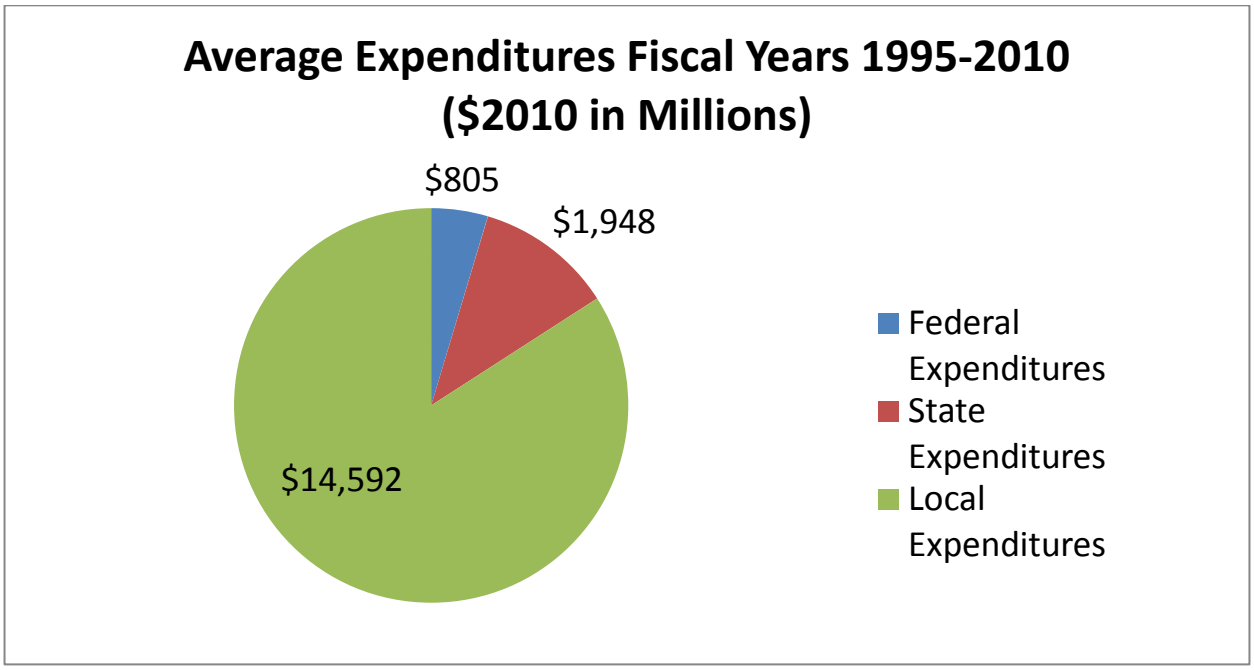


Figure 7-3 Recent Trends in Local, State, and Federal IWM Expenditures (in millions) 1995-2010

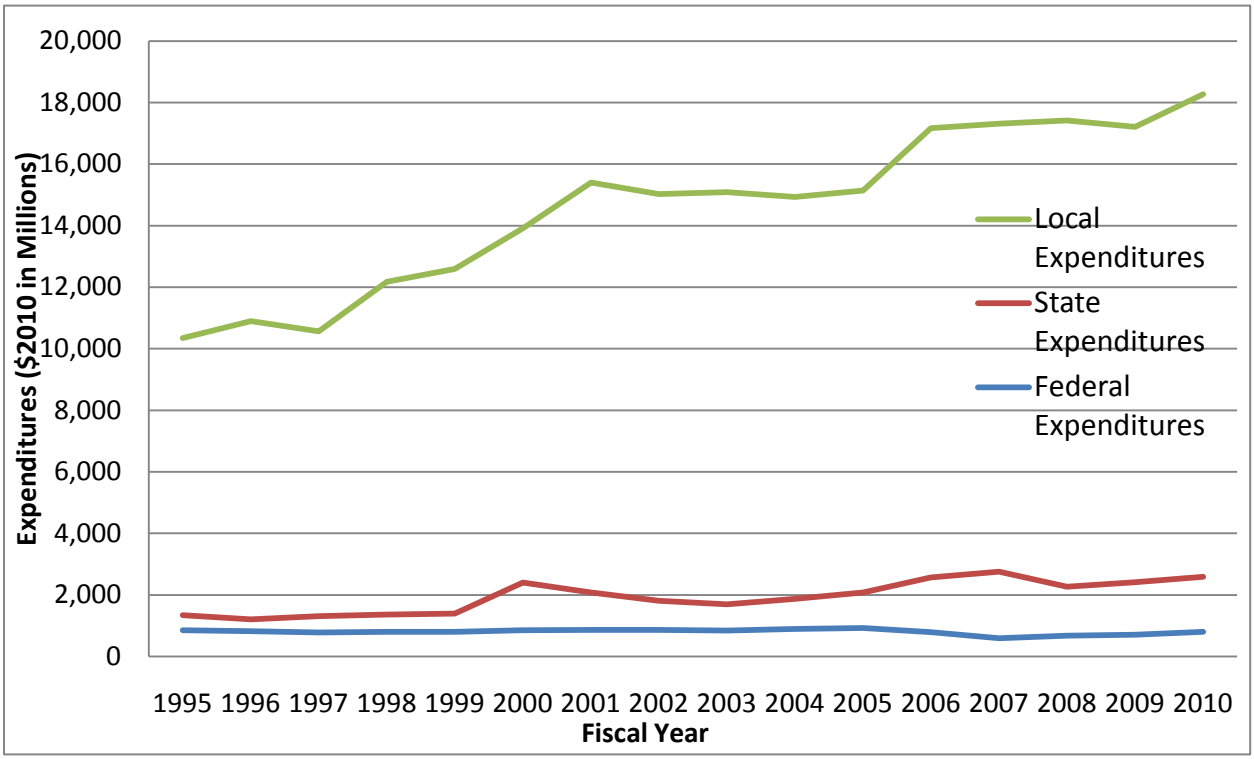
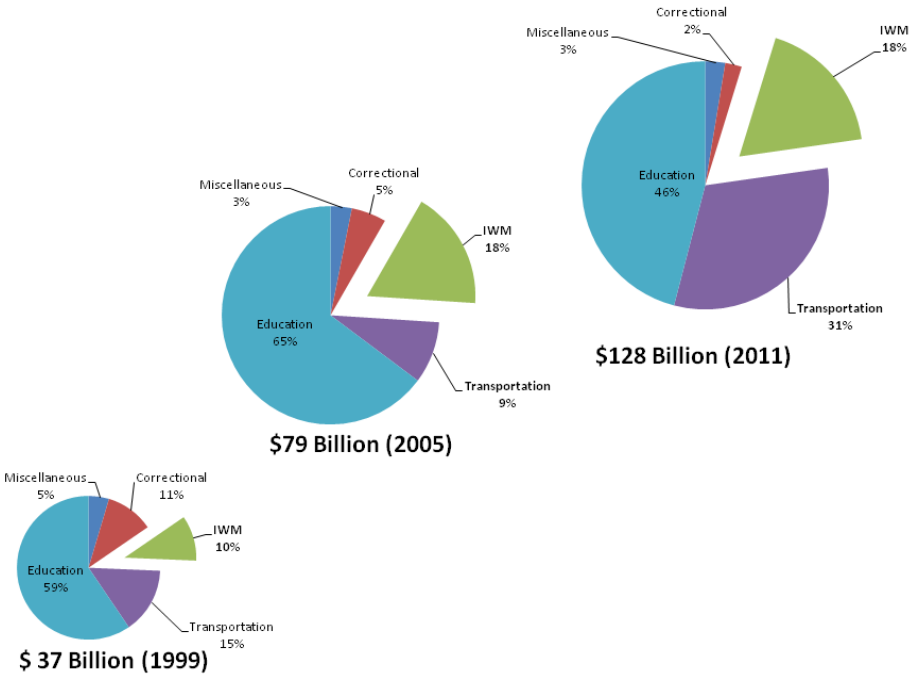


Figure 7-4 Total Authorized State General Obligation Bonds in California



Source: State of California 2010

Figure 7-5 General Obligation Water Bond History, 1970-2010

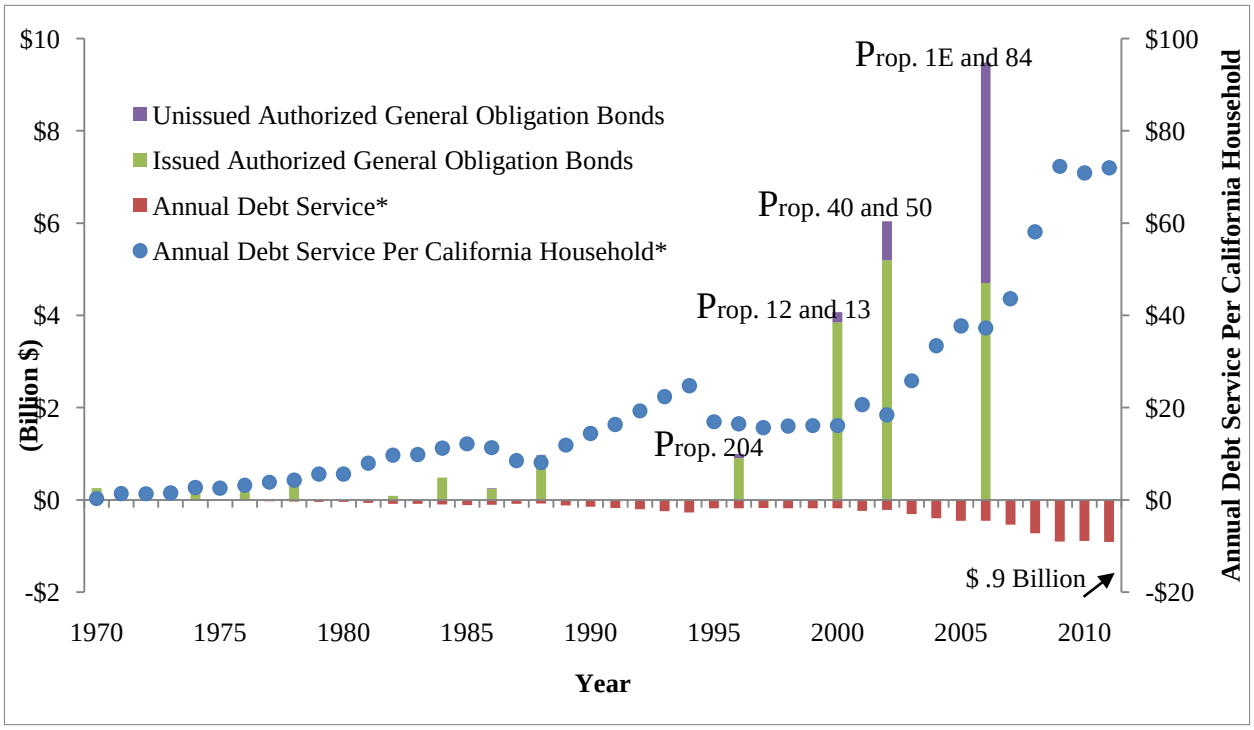


Figure note: Debt service is applicable to issued GO bonds only.
Source: Department of Finance 2012

Box 7-1 Taxes vs. Fees

Taxes are paid by the general public for governmental services that provide benefits to the general public, such as public safety. The payment is mandatory, everyone pays, and there does not need to be a nexus between the payer and service provided. The payer, as well as everyone else, receives a benefit.

Fees are paid for the specific government service that directly benefits the payer. The payer has a choice of whether to use the service.

Box 7-2 Federal Funding Sources

Several federal actions could provide funding for California integrated water management (IWM). Depending on actions by Congress, funding may be available to the State or local governments. Some of the proposed innovative approaches include:

- **Federal Water Infrastructure Trust Fund.** The Water Infrastructure Trust Fund, if established by Congress, would create a stable and long-term revenue stream to finance water infrastructure projects. The current proposal under consideration is H.R. 3145 and includes over $10 billion annually with a focus on clean water projects.
- **Water Infrastructure Finance Innovation Act (WIFIA).** The Water Resources and Environment Subcommittee has circulated a draft WIFIA bill (H.R. 3145) and held two hearings on the topic in 2012. One of the main benefits of the proposed program would be to provide low-cost capital to infrastructure projects.
- **National Infrastructure Bank.** An infrastructure bank manages capital and provides loans for infrastructure development. The most recent proposal, H.R. 402, would create a bank similar to the FDIC. The bank would be authorized to issue bonds and subsidies to infrastructure projects, borrow and, in turn, lend to commercial infrastructure projects, and purchase and sell infrastructure loans and securities on the market.
- **Private Activity Bonds.** Congress is considering modifying Private Activity Bond restrictions. Private Activity Bonds are tax-exempt bonds that are available for privately owned water facilities operated by a government unit or charge water rates that are approved by a subdivision of a community. Private agencies are typically not eligible for tax-exempt municipal bonds, which limits access to capital to finance new infrastructure projects.
- **Build America Bonds.** Congress is considering reinstating Build America Bonds. As part of the American Recovery and Reinvestment Act, Congress created Build America Bonds to encourage job creation through infrastructure projects. Eligible projects were not limited to infrastructure and did not allow for private company participation. The bonds stopped being issued in December 2010. Congress is considering reinstating the bonds to target water infrastructure projects.

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Chapter 8. Roadmap For Action

About This Chapter

Chapter 8 provides the *California Water Plan Update 2013* (Update 2013) roadmap to implement Integrated Water Management (IWM) actions. The roadmap considers immediate and changing conditions and priorities, and the ongoing challenges described earlier in Volume 1, and particularly in Chapter 2, "Imperative to Invest in Innovation and Infrastructure." This chapter presents the elements of the roadmap, namely the vision of sustainable and reliable water resources and management systems. The mission statements herein describe collaborative efforts to prepare for California's most pressing statewide and regional water management issues and challenges, the seven goals that set forth the desired outcomes of the California Water Plan (CWP), and the 10 guiding principles that express the core values and philosophies for how the vision, mission, and goals will be achieved.

Update 2013 identifies seventeen objectives and their 250-plus related actions and sub-actions geared toward fulfilling the vision, mission, goals, and principles. Performance measures to gauge progress on those related actions are also specified. (For further discussion regarding these elements, see Box 8-1 and Volume 4, *Reference Guide*, the article "Strategic Planning Guidelines.") The Update 2013 roadmap builds on accomplishments since *California Water Plan Update 2009* (Update 2009), including ongoing implementation of the 2009 comprehensive water legislation, as well as fundamental water-resource management lessons learned. The roadmap includes near-term and long-term actions that describe how Californians can and should step up existing efforts and initiate new ones to provide integrated, reliable, sustainable, and secure water resources and management systems. These efforts will protect public health, public safety, and ecosystems, as well as ensure the stability of the state's economy, today and for future generations.

Background

Required by the California Water Code Section 10005(a), the CWP is State government's strategic plan for managing and developing water resources statewide. By statute the CWP cannot mandate actions or authorize spending for the related actions. Update 2013 makes neither project-specific nor site-specific recommendations; therefore, it does not include environmental review and documentation as would be required by the California Environmental Quality Act (CEQA).

Policy-makers and lawmakers must take definitive steps to authorize the related actions in this CWP and appropriate the funding needed for their implementation. At the same time, the plan must be embraced by agencies and voting bodies that can implement the related actions. This underscores the need to have broad public participation and support for the CWP to realize its objectives and related actions.

Update 2013 builds on and advances a planning transformation that began with the *California Water Plan Update 2005* (Update 2005) process. Update 2005 was the first of the CWP updates to explicitly include a strategic planning approach from preparation to presentation. Since then, the CWP has become a strategic planning document that more fully describes the entire role of State government and the growing role of California's regions in managing the state's water resources.

PLACEHOLDER Box 8-1 Elements of the Strategic Plan

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Elements of the Roadmap

The vision, mission, goals, guiding principles, and objectives and related actions are similar to those presented in Update 2009. In addition, Update 2013 includes four new objectives reflecting important water management topics. These include objectives that promote enhancing public access to waterways, lakes, and beaches; strengthening alignment between land use and water planning; strengthening government agency alignment; and improving water financing. While some related actions for the various objectives were carried over from Update 2009, many were revised or are new for Update 2013.

Vision

California has healthy, resilient watersheds and reliable and secure water resources and management systems. Public health, safety, and quality of life in rural, suburban, and urban communities are significantly improved as a result of advancements in IWM. The water system provides the certainty needed for quality of life, sustainable economic growth, business vitality, and agricultural productivity. California's unique biological diversity, ecological values, and cultural heritage are protected and have substantially recovered.

Mission

Updating the CWP provides federal, State, tribal, regional, and local governments and organizations with a continuous planning forum to collaboratively:

- Recommend strategic goals, objectives, and near-term and long-term actions that would conserve, manage, develop, and sustain California's watersheds, water resources, and management systems.
- Prepare response plans for floods, droughts, and catastrophic events that would threaten water resources and management systems, the environment, and property, as well as the health, welfare, and livelihood of the people of California.
- Evaluate current and future watershed and water conditions, challenges, and opportunities.

Goals

1. California's water supplies are adequate, reliable, secure, affordable, sustainable, and of suitable quality for beneficial uses to protect, preserve, and enhance watersheds, communities, cultural resources and practices, environmental and agricultural resources, and recreation.
2. State government supports integrated water resources planning and management through leadership, oversight, and public funding.
3. Regional and interregional partnerships play a pivotal role in California water resources planning, water management for sustainable water use and resources, and increasing regional self-reliance.
4. Water resource and land use planners make informed and collaborative decisions and implement integrated actions to increase water supply reliability, use water more efficiently, protect water quality, improve flood protection, promote environmental stewardship, and

ensure environmental justice and public access to water bodies, in light of drivers of change and catastrophic events.

5. California is preparing for climate uncertainty by developing adaptation strategies and investing in a diverse set of actions that reduce the risk and consequences posed by climate change, which make the system more resilient to change and increase the sustainability of water and flood management systems and the ecosystems they depend on.
6. Integrated flood management, as a part of IWM, increases flood protection, improves preparedness and emergency response, enhances floodplain ecosystems, and promotes sustainable flood management systems.
7. The benefits and consequences of water decisions and access to State government resources are equitable across all communities.

Guiding Principles

1. Manage California's water resources and management systems with ecosystem health and water supply and quality reliability as equal goals, with full consideration of public trust uses. Healthy, functioning ecosystems and reliable, quality water supplies are primary and equal goals for water management to help sustain water resources and management systems. Protect public trust uses whenever feasible, and consider public trust values in the planning and allocation of water resources. State government protects the public's rights to commerce, navigation, fisheries, recreation, ecological preservation, and related beneficial uses, including those of its Native American tribes and other communities that depend on these resources for subsistence and cultural practices.
2. Use a broad, stakeholder-based, long-view perspective for water management. Promote multi-objective planning with a regional focus, and coordinate local, regional, interregional, and statewide initiatives. Recognize distinct regional problems, resources, assets, and priorities. Emphasize long-term planning (30- to 50-year horizon) while identifying near-term actions needed to achieve the plan.
3. Promote sustainable resource management on a watershed basis. Wisely use natural resources to ensure their availability for future generations. Promote activities with the greatest multiple benefits regionally and statewide. Consider the interrelationship between water supplies, water conservation, water quality, water infrastructure, flood protection, energy, recreation, land use, economic prosperity, and environmental stewardship on a watershed or ecosystem basis.
4. Increase system flexibility and resiliency. Evaluate and implement strategies that reduce the impacts of droughts and floods in the region. In California, drought contingency planning and integrated flood management are important components of regional water planning.
5. Increase regional self-reliance. Implement resource management strategies that reduce dependence on long-term imports of water from other hydrologic regions for meeting additional future water demands and during times of limited supply, such as a drought or interrupted supply after a catastrophic event (e.g., an earthquake or fire). Reduce reliance on the Sacramento-San Joaquin Delta (Delta) in meeting California's future water demands. Increase regional self-reliance for water by investing in water use efficiency, water recycling, advanced water technologies, local and regional water-supply projects, improved regional coordination of local and regional water supplies, and other strategies. As part of a diverse water portfolio, short-term water transfers between regions that are environmentally, economically, and socially sound can also help increase regional self-reliance overall.

6. Determine values for economic, environmental, and social benefits; costs; and tradeoffs so as to base investment decisions on sustainability indicators. Evaluate programs and projects recognizing economic growth, environmental quality, social equity, and sustainability as coequal objectives. When comparing alternatives, determine the value of potential economic, environmental, and social benefits; beneficiaries; costs; and tradeoffs. Include a plan that avoids, minimizes, and mitigates for adverse impacts.
7. Incorporate future variability, uncertainties, and risk in the decision-making process. Use multiple future scenarios to consider drivers of change and emerging conditions, such as population growth and climate change, when making planning, management, and policy decisions.
8. Apply California's water rights laws, including the longstanding constitutional principles of reasonable use and public trust, as the foundation for public policy-making, planning, and management decisions on California water resources. Recognize that certain natural resources — including water, tides, and submerged lands; the beds and banks of navigable rivers; and fish and wildlife resources — are owned by the public and held in trust for present and future generations of Californians. Native American tribes also depend on these natural resources for subsistence and cultural heritage. Effectively applying existing water rights laws and the twin principles of reasonable use and public trust will provide water for future generations while protecting ecosystem values.
9. Promote environmental justice — the fair treatment of people of all races, cultures, and incomes. Include meaningful community participation in decision-making for State-sponsored or public-funded resource management projects, and consider such factors as community demographics, potential or actual adverse health or environmental impacts, and benefits and burdens of the project on stakeholder groups.
10. Use science, best data, and local and traditional ecological knowledge in a transparent and documented process. When appropriate and possible, use data, information, planning methods, and analytical techniques that have undergone scientific review.

Objectives and Related Actions

The objectives and related actions presented in this roadmap were developed in part from companion state plans and the Tribal Engagement Plan (refer to Chapter 4, "Strengthening Government Alignment"). Meeting the 17 objectives, shown in Box 8-2, will help achieve the CWP goals. Planning and investing in the more than 250 related actions and sub-actions will provide greater system resiliency and help California deal with climate conditions and other future uncertainties and risks. (Note that numbering of the objectives and related actions, below, is for ease of identification and does not represent priority.)

PLACEHOLDER Box 8-2 Update 2013 Objectives

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 1 — Strengthen Integrated Regional Water Management Planning

Strengthen integrated regional water management planning to improve regional self-reliance, and maintain and enhance regional water management partnerships.

The broad purpose of integrated regional water management (IRWM) is to promote a regional planning and implementation framework to comprehensively address water supply, quality, flood, and ecosystem challenges. IRWM also seeks to implement integrated solutions through a collaborative multi-partner process that includes water managers; tribes; non-governmental organizations; federal, State, and local governments; and disadvantaged communities. Over the past 10 years, IRWM has profoundly improved water management in California, and looking ahead there are opportunities for even greater advancement.

The California Department of Water Resources (DWR) is currently exploring these opportunities by developing the Strategic Plan for the Future of Integrated Regional Water Management in California. This plan, expected to be completed in 2014, will help shape the desired future for IRWM and identify measures needed for that future to be achieved. Since the Strategic Plan for the Future of IRWM in California is a companion state plan for the CWP, these measures will likely be incorporated as related actions under this objective as part of Update 2013.

Additional information on the development of the Strategic Plan for the Future of IRWM in California is available at the following Web site: http://www.water.ca.gov/irwm/stratplan/.

Related Actions

[Note: These related actions are under development and will include actions and recommendations from the IRWM Strategic Plan, when available.]

PLACEHOLDER Table 8-1 Related Actions and Performance Measures for Objective 1 (Strengthen Integrated Regional Water Management Planning)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 2 — Use and Reuse Water More Efficiently

> Use water more efficiently with significantly greater water conservation, recycling, and reuse to help meet future water demands and adapt to climate change.

Urban and agricultural water use efficiency are important tools for meeting current and future water demands and maximizing beneficial use of the state's water resources. To minimize the impacts on California's natural environment and support meeting statewide and local water demands, our cities and farms must continue to increase water use efficiency to maximize benefits from existing and future water supplies. Californians have been successful in increasing water-use efficiency measures, such as low water-use landscaping, water-efficient appliances, and municipal wastewater recycling; however, increasing population and climate change impacts require continued aggressive focus and investment in water-use efficiency efforts.

Key components of California's actions to increase water use efficiency are contained within the 2009 Comprehensive Water Package (Senate Bill [SB] X7-7), which requires urban water agencies to reduce statewide per capita water consumption 20 percent by 2020 and make incremental progress toward this goal by reducing per capita water use by at least 10 percent on or before December 31, 2015. The bill also requires agricultural water suppliers to measure water deliveries and adopt a pricing structure for water customers based in part on quantity delivered, and, where technically and economically feasible, to implement additional measures to improve efficiency.

Water use efficiency is a fundamental component of California water planning because it integrates and benefits key components of water supply planning and environmental stewardship. It is a key part of the water management portfolio of every water agency, city, county, farm, and business, including State and federal government agencies. Water use efficiency and conservation reduce water demand and, in turn, wastewater generation. This reduces water and wastewater treatment needs, thereby reducing energy demand and greenhouse gas (GHG) emissions. Efficient water use also includes the development of local water supplies, which has the dual benefit of reducing energy demands for water transportation and reducing reliance on water supplies that may be strongly influenced by fluctuating availability. Efficient water use also matches water quality to water use ("fit for use"), primarily to identify water reuse opportunities that minimize the need for high-level and energy-intensive treatment. While these water management issues have statewide impacts, they are primarily implemented at the local and regional levels.

The related actions identified below are specific measures that can be implemented during the term of Update 2013 to support this objective of using and reusing water more efficiently. They focus on increased water education to continue to raise awareness of the need for all Californians to be efficient with use of our shared resource, development of agricultural and urban water tools and metrics, and preparation of a statewide recycled water strategic plan.

Related Actions

2.1 The State should expand public information efforts to promote water conservation in both the urban and agricultural sectors to better inform all Californians about the importance and value of water and about ways to use water more efficiently. The expanded campaign should be designed with specific informational goals and objectives and should operate on a continuous basis in wet years as well as dry years. This campaign will assist local water suppliers and the State in achieving the 2020 water use targets.

2.2 DWR, with the California Urban Water Conservation Council (CUWCC) and the State Water Resources Control Board (SWRCB), should research and promote water rate structures that provide conservation price signal to customers while maintaining revenue stability for the water utilities.

2.3 DWR, with the SWRCB and California Department of Public Health (CDPH), should prepare a California Municipal Water Recycling Strategic Plan to guide expanded statewide use of recycled water to help sustain statewide water supplies. The strategic plan will include:

- 2.3.1 Review and status of implementation of the 2003 Recycled Water Task Force findings.
- 2.3.2 Regional assessment and quantification of current and proposed recycled water capacities and demands.
- 2.3.3 Evaluation of better alignment of the level of treatment required for recycled water use in agricultural and environmental applications to create more opportunities for recycled water use and reduce the energy required to produce recycled water.
- 2.3.4 Consideration of potential groundwater degradation issues and coordination with Salt and Nutrient Management Plan implementation.
- 2.3.5 Regional evaluation of barriers to additional recycled water use and proposing solutions, including indirect and direct potable reuse issues, to support continued expansion of recycled water use.

2.4 The State should establish a water use efficiency and alternative supply research program to speed the development, testing, and implementation of promising new technology and approaches to water management. The program should conduct studies in all sectors of water use, including agriculture, municipal and industrial, and in the alternative supply areas of recycling, greywater, stormwater capture, and desalination. The level of sponsored research should match that of the State's energy-use efficiency research programs.

2.5 DWR should research and assist water suppliers in using new tools to measure landscape area. The landscape area data can be used to establish water budgets for customer accounts. Water suppliers can use the water budget program to better focus their water conservation efforts toward customers who are using excess water.

2.6 DWR, in cooperation with urban water-use community, should conduct a study to identify the barriers, costs, and technical assistance required to establish standard urban water-use classifications for water use reporting. The standard classifications would allow for water supplier data to be more accurately aggregated at the regional and statewide levels and permit a more detailed and accurate reporting of California water use.

2.7 Agricultural and urban water suppliers should report water supply system leakage and spills in their water management plans. Agricultural suppliers should measure and report canal seepage and district outflows. Urban water suppliers should calculate and report unaccounted-for distribution system water.

2.8 All levels of government should establish policies and provide incentives to promote better urban runoff management and reuse. Urban and, where feasible, rural communities should invest in facilities to capture, store, treat, and use urban stormwater runoff, such as percolation to usable aquifers, underground storage beneath parks, small surface basins, in drains, or the creation of catch basins or sumps downhill of development. Depending on the source and application, captured stormwater may be suitable for use without additional treatment, or it may be blended to augment local supplies.

PLACEHOLDER Table 8-2 Related Actions and Performance Measures for Objective 2 (Use and Reuse Water More Efficiently)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 3 — Expand Conjunctive Management of Multiple Supplies

Advance and expand conjunctive management of multiple water supply sources with existing and new surface and groundwater storage to prepare for future droughts, floods, and climate change.

California can prepare for future droughts, flood, and climate change, as well as improve water supply reliability and water quality, by managing the extensive water storage capacity of groundwater basins in closer coordination with existing and new surface storage and other water supply sources when available. The other supply sources include, but are not limited to, recycled municipal water, surface runoff and

floodflows, urban runoff and stormwater, imported water, water transfers, and desalination of brackish and sea water.

Surface and groundwater resources must be managed much more conjunctively when feasible to meet the challenges of climate change. Additional water storage and conveyance improvements are also necessary to provide better flood management, water quality, and system reliability in response to daily and seasonal variations and uncertainties in water supply and use, and to facilitate water transfers within and among regions.

During droughts, California has historically depended on its groundwater. However, many aquifers are contaminated, requiring remediation if they are to be used as viable water banks. Moreover, groundwater resources will not be immune to climate change; in fact, historical patterns of groundwater recharge may change considerably as a result of climate change. Because droughts may be exacerbated by climate change, more efficient groundwater basin management will be necessary to minimize additional groundwater depletion and to utilize opportunities to store water underground and substantially reduce existing overdraft.

Along with more effective use of groundwater storage, better regional and systemwide water management and the reoperation of surface storage reservoirs and related infrastructure of flood and water management systems can provide many benefits in a changing climate. These include capturing higher peak flows to protect beneficial uses of water, such as protecting drinking water quality, providing cold water releases for fish, preventing seawater intrusion, generating clean hydroelectricity, providing recreational opportunities in a warmer climate, and offsetting the loss of snowpack storage by facilitating increased storage of water above and below the ground.

System reoperation of existing flood and water infrastructure will require the active cooperation of many agencies, local governments, and landowners. Successful system reoperation will require that the benefits are evident to federal, tribal, regional, and local partners. Systemwide operational coordination and cooperation need to occur in advance of responding to extreme hydrologic events that may become larger and more frequent with climate change.

Related Actions

3.1 Promote public education about California's groundwater.

3.2 Improve collaboration and coordination among federal, State, tribal, regional, and local agencies and organizations to ensure data integration, coordinate program implementation, and minimize duplication of efforts.

3.3 Increase availability and sharing of groundwater information.

3.4 Strengthen and expand the California Statewide Groundwater Elevation Monitoring (CASGEM) Program for its long-term sustainability.

3.5 Under the CASGEM Program, improve understanding of California groundwater basins by conducting groundwater basin assessments of CASGEM high-priority basins in conjunction with the CWP 5-year production cycle.

3.6 Conduct an assessment of all SB 1938 groundwater management plans and develop guidelines to promote best practices in groundwater management.

3.7 Develop analytical tools to assess conjunctive management and groundwater management strategies.

3.8 Increase statewide groundwater recharge and storage by two (2) million acre-feet (maf) (current average annual statewide groundwater use is about 16 maf).

3.9 Evaluate reoperation of the state's existing water supply and flood control systems.

3.10 DWR and the U.S. Bureau of Reclamation (USBR) should:

- 3.10.1 Complete the North-of-the-Delta Offstream Storage, Shasta Lake Water Resources, and Upper San Joaquin River Basin Storage investigations.
- 3.10.2 Complete the investigation of the further enlargement of the Los Vaqueros Reservoir.
- 3.10.3 USBR, in collaboration with DWR, should complete an investigation to enlarge/raise BF Sisk Dam and San Luis Reservoir.

PLACEHOLDER Table 8-3 Related Actions and Performance Measures for Objective 3 (Expand Conjunctive Management of Multiple Supplies)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 4 — Protect and Restore Surface Water and Groundwater Quality

Protect and restore surface water and groundwater quality to safeguard public and environmental health and secure California's water supplies for beneficial uses.

As California's population continues to grow and climate change impacts continue to occur, greater demands will be made on the available water supply, and threats to water quality from known and emerging pollutants will increase, potentially causing further impairments to the waters and their uses. When water quality is impaired, the state is deprived of critical water supplies needed to support its growing population, vital economy, and the environment. Protecting and restoring water quality ensures that water supplies are available for all beneficial uses and all communities. It is also a crucial element of IWM and essential to maintaining healthy watersheds.

Healthy watersheds, or drainage basins, that provide clean and plentiful surface water and groundwater, and support healthy riparian and wetland habitat, are essential to support California's resources and economic future. A watershed approach is hydrologically focused; recognizes the degree to which groundwater and surface water bodies are connected physically; is aware of the linkages between water quantity and water quality; and requires a comprehensive, long-term approach to water resources management that takes system interactions into account. State government efforts to protect and restore water quality are essential but alone cannot support a comprehensive watershed protection approach. Success depends on the integration of federal, State, tribal, regional, and local programs and projects, including land use decisions made by local officials, stakeholder involvement, and the actions of millions of individuals, which, when taken together, can have significant impacts and make a difference.

Related Actions

4.1 Protect and restore surface water quality by implementing strategies to protect the past, present, and probable future beneficial uses for all 2010-listed (Clean Water Act, Section 303[d]) water bodies by 2030.

- 4.1.1 Implement a statewide strategy to efficiently prepare, adopt, and implement total maximum daily loads (TMDLs), which result in water bodies meeting water quality standards, and adopt and begin implementation of TMDLs for all 2010-listed water bodies by 2019.
- 4.1.2 Manage urban runoff volume to reduce pollutant loadings, reduce wet weather beach postings and closures by 75 percent by 2020, eliminate dry weather beach closures and postings and, where applicable, promote stormwater capture and re-use for development of sustainable local water supplies.
- 4.1.3 Take appropriate enforcement actions and innovative approaches as needed to protect and restore the beneficial uses of all surface waters.

4.2 Protect and restore groundwater quality by improving and protecting groundwater quality in high-use basins by 2030.

- 4.2.1 Communities should implement an integrated groundwater protection approach to improve and protect groundwater in high-use basins that:
  - A. Evaluate and regulate activities that impact or have the potential to impact beneficial uses.
  - B. Recognize the effects of groundwater and surface water interactions on groundwater quality and quantity.
  - C. Encourage and facilitate local management of groundwater resources.
- 4.2.2 State government should identify strategies to ensure that communities with contaminated groundwater have a clean and reliable drinking water supply, which may include remediation of polluted or contaminated groundwater, surface water replacement, and/or groundwater treatment.
- 4.2.3 State government should implement the recommendations in the SWRCB's Report to the Legislature on addressing issues associated with nitrate contaminated groundwater.
- 4.2.4 The SWRCB and Regional Water Quality Control Boards (RWQCBss) should maintain high-quality groundwater basins through application of antidegradation directives using waste discharge requirements (WDRs) and the remediation of polluted or contaminated groundwater.
- 4.2.5 Regional and local stakeholders should prepare salt and nutrient management plans for each groundwater basin/subbasin in California by 2016. These salt/nutrient management plans should be prepared as outlined in the SWRCB's Water Quality Control Policy for Recycled Water adopted May 14, 2009, the purpose of which is to increase the use of recycled water from municipal wastewater sources that meets the definition in California Water Code section 13050(n), in a manner that implements State and federal water quality laws. The RWQCBs should incorporate salt and nutrient management plans into basin plans, where appropriate.

4.3 Comprehensively address water quality protection and restoration, and the relationship between water supply and water quality, and describe the connections between water quality, water quantity, and climate change, throughout California's water planning processes.

- 4.3.1 As part of the CWP, the SWRCB should prepare a comprehensive water quality policy to guide the State's water management activities, including protection and restoration of water quality through the integration of statewide policies and plans, regional water quality control plans (basin plans), and the potential effects of climate change on water quality and supply.

4.3.2 RWQCBs should consistently organize basin plans to provide a clear structure that readily conveys key elements (e.g., beneficial uses, potential impacts of climate change, water quality objectives, goals for watersheds, plans for achieving those goals, and monitoring to inform and adjust the plans) and that fully integrates other water quality control plans, such as the California Ocean Plan and Water Quality Control Plan for Enclosed Bays and Estuaries.

4.3.3 RWQCBs should adopt basin plan amendments through a collaborative process that involves third parties and incorporates SWRCB requirements and stakeholder interests. An example is the Santa Ana RWQCB's Basin Plan amendment initiated with funding assistance from stakeholders as required in the SWRCB's Recycled Water Policy.

4.3.4 State Government should continue to support efforts of the California Water Quality Monitoring Council to develop a centralized Geographic Information System (GIS) database (EcoAtlas) that displays watershed information, including watershed boundaries, TMDLs, monitoring data, water body types, assigned BUs, wetlands, California Rapid Assessment Method scores, vegetation types, and other data. A key component of effective water quality planning is access to pertinent watershed information so that regulatory actions can strategically protect and improve watershed aquatic resources.

4.4 To protect source water and safeguard water quality for all beneficial uses, State government should implement the recommendations from the following CWP Resource Management Strategies found in Volume 3: pollution prevention, matching water quality to use, salt and salinity management, urban stormwater runoff management, groundwater/aquifer remediation, recharge area protection, municipal recycled water, and drinking water treatment and distribution.

4.5 CDPH will continue to implement its Small Water System Program Plan to assist small water systems (especially those serving disadvantaged communities) that are unable to provide water that meets primary drinking water standards.

4.5.1 CDPH will share the Small Water System Program Plan with relevant federal, tribal, State, regional, and local agencies, as well as stakeholders, to foster additional opportunities for funding, coordinate construction projects in communities, and to assist in local and regional planning efforts.

4.5.2 CDPH will utilize GIS tools to identify large water systems in close proximity to targeted small water systems, and conduct targeted outreach to these large water systems to encourage them to consolidate the small systems into their service area.

4.5.3 CDPH will work with stakeholders to identify obstacles to consolidation (including financial, legal, and local issues) and develop possible actions to address these obstacles.

4.5.4 CDPH will participate in statewide planning efforts to address the water infrastructure needs of small water systems. CDPH should seek input from other states and the federal government on innovative, successful efforts to address the needs of small water systems, and should share its results on implementation of its Small Water System Program Plan.

PLACEHOLDER Table 8-4 Related Actions and Performance Measures for Objective 4 (Protect and Restore Surface Water and Groundwater Quality)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 5 — Practice Environmental Stewardship

Practice, promote, improve, and expand environmental stewardship to protect biological diversity and sustain natural water and flood management systems in watersheds, on floodplains, and in aquatic habitats.

California has lost more than 90 percent of the wetlands and riparian forests that existed before the Gold Rush. Successful restoration of aquatic, riparian, and floodplain species and natural communities ordinarily depends on at least partial restoration of physical processes that are driven by water. These processes include the flooding of floodplains, the natural pattern of erosion and deposition of sediment, the balance between infiltrated water and runoff, and large seasonal variation in stream flow. Reduction of these physical processes often leads to displacement of native species by exotic species, which presents another huge barrier to ecosystem restoration.

Water supply and flood management projects that preserve, enhance, and restore biological diversity and ecosystem processes are likely to be more sustainable — operating as desired with less maintenance — than those that do not. Projects are more sustainable when they work with, rather than against, natural processes that distribute water and sediment. To include ecosystem restoration in a project usually requires a degree of return to more natural patterns of erosion, sedimentation, flooding, and stream flow, among others. This, in turn, makes such projects less susceptible to the effects of catastrophic events and minimizes the cost and effort of maintenance.

Related Actions

5.1 Governments and the private sector should work together to create and maintain a network of protected reserve areas across the state that builds on existing conservation investments, and provides refuge areas and migration corridors that allow species to adjust to conditions associated with climate change. The network should include river corridors that connect high elevations to valleys and reestablish natural hydrologic connections between rivers and their historic floodplains. (California Natural Resources Agency 2009)

- 5.1.1 The California Natural Resources Agency should develop and implement a comprehensive tracking system to identify the lands that already are protected and lands that are a priority for protection.

5.2 All agencies that own and operate water and flood management systems should include actions in their respective natural resource management plans that restore natural processes of erosion and sedimentation in rivers and streams and increase the quantity, diversity, quality, and connectivity of riverine and floodplain habitats. Local planning activities, including integrated regional water management (IRWM), urban water management plans, watershed management plans, natural community conservation plans, habitat conservation plans, and other water resource or floodplain focused planning efforts, should include objectives to meet these goals.

- 5.2.1 Re-establish one million acres of contiguous natural riparian, wetland, and floodplain habitat that is subject to periodic flooding for at least 50 percent of the river miles in the regions. This can contribute to Assembly Bill (AB) 32 GHG reduction goals through enhanced carbon sequestration. IRWM and regional flood management plans that incorporate corridor connectivity and restoration of native aquatic and terrestrial habitats to support increased biodiversity and resilience to a changing climate should receive additional credits in State government water and flood grant programs. (See objectives 1, 2, and 6)

5.3 State and federal governments should encourage, prioritize, and identify financing for actions to protect, enhance, and restore at least one million acres of upper watershed forests and meadows that act as natural water and snow storage. These actions should include efforts to reduce the risks and impacts of catastrophic wildfire. This measure improves water supply reliability, protects water quality, safeguards high-elevation habitats, and supports carbon sequestration and forest-based economies. (See objectives 1, 3, and 4.) (Association of California Water Agencies 2013; California Air Resources Board 2008)

5.4 Governments and the private sector should develop and support programs that pay private landowners and managers to protect and improve habitat and nature's water-related services, including flood protection, water quality, groundwater recharge and storage, reversal of land subsidence, prevention of large wildfires, shading of rivers and streams, and reduced soil erosion.

5.5 Governments and the private sector should work to incorporate the economic value of nature's goods and services into natural resource management decisions. Such recognition should include development of ways to measure the economic value of those services and the financial return from investment in their protection and enhancement.

5.6 Federal, state, and local agencies should provide greater resources and coordinate efforts to control invasive species and prevent their introduction. (California Department of Fish and Game 2007)

5.7 State and federal government should work with dam owners/operators, tribes, and other stakeholders to evaluate opportunities and technologies to reintroduce anadromous fish to upper watersheds. Re-establishment of anadromous fish upstream of dams may provide flexibility in providing cold water downstream in conjunction with water and flood systems reoperation strategies. The State and federal governments should develop funding sources to support partnerships in constructing fish passage at dams and to assist removal of obsolete dams that pose a public safety and ecological risk.

5.8 State, federal, and local government should identify and prioritize protection of lands of San Francisco Bay and the Delta that will provide the habitat range for tidal wetlands to adapt to and shift with sea level rise. A climate change resilient San Francisco Bay and Delta should include creating greater flood capacity by construction of setback levees on islands and removal of strategic island levees that also creates opportunities for tidal wetland and riparian restoration. Such lands and actions can help maintain estuarine ecosystem functions and act as storm buffers, protecting people and property from flood damages. (San Francisco Estuary Partnership 2007)

5.9 State government should prioritize and expand Delta islands and Suisun Marsh subsidence reversal and land accretion projects to help reestablish equilibrium between land and estuary elevations. Sediment-soil accretion is a cost-effective, natural process that can help sustain the Delta and Suisun Marsh ecosystem, and reduce communities' risks from flooding, as well as sequester carbon and restore estuarine ecosystem functions.

5.10 State and federal government should fund natural resource protection agencies to continue work to determine fishery needs and provide funds for water right holders to meet those needs.

PLACEHOLDER Table 8-5 Related Actions and Performance Measures for Objective 5 (Practice Environmental Stewardship)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 6 — Improve Flood Management Using an Integrated Water Management Approach

> Promote and practice flood management that reduces flood risk to people and property and maintains and enhances natural floodplain functions using an IWM approach. An IWM approach utilizes a systemwide perspective and considers all aspects of water management, including public safety and emergency management, environmental sustainability, and economic stability (which includes water supply reliability, water quality, and system and community resiliency).

Flood management has traditionally had the single purpose of protecting people and property that could be harmed by flood waters by separating them from the flood. In contrast, flood management using an IWM approach seeks to protect people and property exposed to flooding, while also addressing the quality and functioning of ecosystems, the reliability of water supply and water quality, and economic stability (including both economic and cultural considerations). This shift changes the focus of flood management from managing flood water to managing floodplains, thus allowing for both a local and a systemwide context.

Today, one in five Californians live in a floodplain. There are more than 20,000 miles of levees, over 1,500 dams, more than 1,000 debris basins, and other facilities statewide that manage flood water and provide flood risk reduction. Traditionally, Californians have reduced the risk of flooding through actions like building dams, levees, and other facilities that constrain floodwaters and provide protection to people from the harmful aspects of flooding, but these facilities also diminish the natural benefits of floods. These facilities face a number of challenges, including reaching the end of their useful life, inadequate operations and maintenance, insufficient capacities, and stressors resulting from climate change. Climate change may cause sea levels to rise, produce higher tides, shift precipitation patterns toward more intense winter storms, and produce higher peak flows, thereby increasing the state's flood risk.

A collection of laws passed in 2007 and 2008 focused attention on flooding and the risks it poses. These laws intended to promote a new perspective for managing floods. Despite the amount of progress and improvements that have been made since the passage of these laws, Californians still face an unacceptable level of flood risk. Current infrastructure strains to meet existing objectives, and changing climatic conditions could exacerbate this situation. With climate change and other changing conditions, improving system flexibility and adaptability must be a fundamental tactic, especially with respect to water and flood system operations and management (see Objective 3).

Flood management is evolving from narrowly focused traditional approaches toward an IWM approach. This more integrated approach includes a mix of structural and non-structural approaches to reduce flood risk and enhance the ability of undeveloped floodplains and other open spaces to behave more naturally to absorb, store, and slowly release floodwaters during small and medium-size events. Flood management using an IWM approach considers land and water resources on a watershed scale to maximize the benefits

of floodplains; minimize loss of life and damage to property from flooding; recognize the benefits to ecosystems from periodic flooding; and provide other potential benefits, such as water supply reliability, water quality improvements, and increased recreation opportunities. Flood management using an IWM approach extends the range of resource management strategies that could be employed and leads to addressing a wide variety of needs. Using an IWM approach encourages an increased understanding of the cause and effect of different management actions. Additionally, the IWM approach is tailored to the physical attributes of a hydrologic region or watershed; the presence of undeveloped floodplains; the type of flood hazards (e.g., riverine, alluvial fan, coastal); and the areal extent of flooding.

An IWM approach requires unprecedented alignment and cooperation among public agencies, tribal entities, land owners, interest-based groups, and other stakeholders. This approach relies on blending knowledge from a variety of disciplines, including engineering, planning, economics, environmental science, public policy, and public information. It is not a one-time activity but rather an ongoing process. The following table of actions provides recommendations for improving flood management by using an IWM approach.

Related Actions

6.1 Agencies at all levels should utilize IWM principles that consider flood risk, mitigation, and protection of natural floodplain functions for planning and implementing flood management projects. Collaborate with planners, engineers, scientists, regulators, and other stakeholders to identify flood risk reduction and floodplain restoration strategies that can be used in local and regional planning efforts such as general plans, regional economic and transportation plans, resource conservation plans, floodplain management plans, and others. This should include best management practices (BMPs) for coastal zones, alluvial fans, headwaters, and riverine floodplains in urbanized and non-urbanized areas**.**

6.2 The State should prepare an update to the 2013 California's Flood Future Report: Recommendations for Managing the State's Flood Risk (California's Flood Future), which further advances the recommendations developed as part of the original California's Flood Future effort.

6.3 Local agencies should work together in regions to develop regional flood risk assessments to evaluate potential adverse impacts of flooding on life, property, infrastructure, the environment, and the economy. The risk assessments should be developed through regional collaboration among local, state, and federal stakeholders, and based on a consistent methodology, appropriate to the region, for flood risk assessment. This assessment should include a determined acceptable level of flood risk for people, property, and the environment within the region. The flood risk assessments should include a set of digital maps for planning and communication of flood risk to agencies, the public, elected officials, and other stakeholders.

6.4 The State should develop comprehensive economic evaluation guidance for flood risk assessment and other flood management activities. The economic evaluation guidance should include methods to evaluate ecosystem services and other IWM benefits and should be adaptable to different areas of the state.

6.5 Local agencies should work together regionally to develop regional flood risk management plans based on regional risk assessments and define short-term and long-term goals, objectives, actions, and

associated implementation strategies for reducing flood risk, as well as define opportunities to enhance natural floodplain functions and provide other IWM benefits. These plans should reflect a collaborative, stakeholder-based process addressing the unique regional and statewide interests, critical needs, and priorities. These plans should address, as appropriate: the locally identified level of flood protection; flood risk and flood damage reduction and mitigation strategies, including natural floodplain function; operations and maintenance; and local, regional and state IWM strategies.

6.6 The State should work with federal and local agencies to develop a statewide flood management investment approach. This approach would evaluate short- and long-term financing needs, as well as available investment strategies, and should lay out potential future investment alternatives for flood management statewide. This action will also be informed by the outcomes of Objective 17.

6.7 The State should take appropriate action to facilitate revenue generation and support regional flood risk management. This includes as evaluation of existing financing mechanisms and legal frameworks to facilitate the development of regional flood-risk reduction financing.

6.8 The State should work with stakeholders to develop BMPs for land use planning that achieve flood risk reduction and protection of natural floodplain functions. The State should collaborate with planners, engineers, scientists, regulators, and other stakeholders. BMPs should be developed for local planning (e.g., general plans, land use regulations) that is conducted by cities and counties and for regional planning (e.g., sustainable communities strategies and blueprint plans) that is conducted by regional planning agencies. Land use planning BMPs should be developed for coastal zones, alluvial fans, headwaters, and riverine floodplains in urbanized and non-urbanized areas.

6.9 The State should work with federal and local agencies to develop a comprehensive regional vulnerability analysis approach and set of regional adaptation strategies for climate change impacts on flood risk and floodplain ecosystems.

6.10 The State should create and coordinate statewide and regional environmental regulatory working groups to improve and streamline regulatory review processes that will address critical flood risk reduction projects, flood system maintenance, flood emergency response, and floodplain restoration (see Objective 16). State and federal environmental regulatory agencies, in collaboration with regional stakeholders, should take actions to streamline regulatory review while recognizing the unique differences among geographical regions of the state.

6.11 The State should develop a comprehensive set of materials and tools to assist public agencies in obtaining accurate information on flood risk and floodplain conditions and increase public awareness of flood risks and potential IWM solutions in that region. The State should develop regional and statewide indicators of flood risk and floodplain conditions and create online regional and statewide flood risk and floodplain information resources for government agencies and for the public. These resources should include regional maps with information on flood risk and floodplain conditions and indicators; outreach and communication tools, including tailored outreach materials as needed to meet the unique needs of each region; and materials that clarify the roles and responsibilities of local, state and federal agencies in flood risk reduction and floodplain restoration efforts, including emergency response.

6.12 The State should increase support for flood emergency preparedness, response, and recovery programs to reduce flood risk by identifying data and forecasting needs; conducting statewide flood emergency management (EM) exercises; working with locals to improve flood EM plans; and supporting increased coordination between flood EM responders, planners, facility managers, and resource agencies. (See Objective 8).

6.13 In June 2012, the Central Valley Flood Protection Board adopted the first Central Valley Flood Protection Plan (CVFPP). Prepared by DWR, the plan presents a long-term vision for improving integrated flood management in the Central Valley and achieving a more flexible, resilient, and sustainable flood management system over time. In implementing this vision, the State should take the following actions consistent with the goals of the CVFPP:

- 6.13.1 Update the CVFPP in years ending in 2 and 7.
- 6.13.2 Continue to work with local and regional entities and the federal government to plan and refine physical improvements to the State Plan of Flood Control.
- 6.13.3 Periodically update the Flood Control System Status Report (FCSSR), which provides information on the current status and conditions of State Plan of Flood Control facilities.
- 6.13.4 Continue to develop criteria and guidance to assist local cities and counties in demonstrating an urban level of flood protection consistent with State law.
- 6.13.5 Continue to develop policies, guidance, and funding mechanisms to implement flood management projects by using an IWM approach in the Central Valley.
- 6.13.6 Continue to develop guidance and take actions to support wise management of floodplains and residual flood risks present in floodplains protected by the State Plan of Flood Control.

6.14 In May 2013, the Delta Stewardship Council adopted the Delta Plan. The Delta Plan was developed to guide State and local agencies to help achieve the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. To support the implementation of the Delta Plan, the following flood-related actions should be taken:

- 6.14.1 The Legislature should establish a Delta Flood Risk Management Assessment District with fee authority (including over State infrastructure).
- 6.14.2 The Legislature should fund the State to evaluate and implement a bypass and floodway on the San Joaquin River near Paradise Cut.
- 6.14.3 The State should evaluate whether additional areas both within and upstream of the Delta should be designated as floodways and should include the consideration of the anticipated effects of climate change in these areas.
- 6.14.4 The State should develop criteria to define locations for future setback levees in the Delta and Delta watershed.
- 6.14.5 The Legislature should require adequate levels of flood insurance for residences, businesses, and industries in flood-prone areas.
- 6.14.6 The Legislature should consider statutory and/or constitutional changes that would address the State's potential flood liability.
- 6.14.7 The U.S. Army Corps of Engineers (USACE) should consider a variance that exempts Delta levees from the USACE's levee vegetation policy.
- 6.14.8 State and local agencies and regulated utilities that own and/or operate infrastructure in the Delta should prepare coordinated emergency response plans to protect the infrastructure from long-term outages resulting from failures of the Delta levees. The emergency procedures should consider methods that also would protect Delta land use and ecosystem.

PLACEHOLDER Table 8-6 Related Actions and Performance Measures for Objective 6 (Improve Flood Management Using an Integrated Water Management Approach)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 7 — Manage the Delta to Achieve the Coequal Goals for California

> Manage the Delta as both a critically important hub of the California water system and as California's most valuable estuary and wetland ecosystem. Achieve the two coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place.

After years of slow decline, the condition of the Delta's watery ecosystem, as measured especially by the population of wild salmon and other native fishes, has gone critical. Today, all those who depend on or value the Delta are, in a word, afraid. Delta residents face the possibility of floods from the east when the rivers flow strongly and of salinity intrusion from the west if they flow feebly. Fishermen, both commercial and recreational, fret about the future of salmon and other species. Water suppliers that receive water from the Delta find those supplies insecure and subject to interruption by weather vagaries, levee failures, or pumping restrictions imposed in the desperate attempt to stem the decline of fish.

In 2009, the Legislature made its latest, most determined bid to find solutions, passing the Delta Reform Act and associated bills. First and foremost, it declared that State policy toward the Delta must henceforth serve two "coequal goals" (see Box 8-3):

- Providing a more reliable water supply for California.
- Protecting, restoring, and enhancing the Delta ecosystem.

These goals, the Legislature added, must be met in a manner that:

- Protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place.

By affirming the equal status of ecosystem health and water supply reliability, the Legislature changed the terms of the conversation. It changed them further with the following pronouncement: "The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs." Here was recognition that, for the sake of the water system and the Delta both, a partial weaning of the one from the other is required.

With the package of 2009 water bills, the Legislature also established the Delta Stewardship Council with a mandate to resolve long-standing issues and to develop a Delta Plan. The Delta Plan is California's plan for the Delta, prepared in consultation with, and to be carried out by, all agencies in the field: the SWRCB, which allocates water rights and protects water quality; DWR, which is the State's water planner and operator of the State Water Project; the California Department of Fish and Wildlife (DFW), which is responsible for the welfare of the living system of the Delta; the Delta Protection Commission, which oversees land use and development on low-lying Delta islands; and many more agencies, State and local.

PLACEHOLDER Box 8-3 Delta Policy on Coequal Goals

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Related Actions

7.1 State or local public agencies undertaking covered actions must file certifications of consistency with the Delta Stewardship Council. Certifications of Consistency must include detailed findings that demonstrate how the covered action is consistent with all the policies of the Delta Plan.

7.2 Provide a more reliable water supply for California by implementing the following:

7.2.1 All water suppliers should fully implement applicable water efficiency and water management laws, including urban water management plans; the 20 percent reduction in statewide urban per capita water usage by 2020; agricultural water management plans; and other applicable water laws, regulations, or rules.

7.2.2 DWR, in consultation with the Delta Stewardship Council, the SWRCB, and others, should develop and approve guidelines for the preparation of a water supply reliability element as part of the update of an urban water management plan, agricultural water management plan, integrated water management plan, or other plan that provides equivalent information about the supplier's planned investments in water conservation and water supply development. The expanded water supply reliability element should include the details recommended in the Delta Plan. Water suppliers that receive water from the Delta watershed should include an expanded water supply reliability element in their water management plans, starting in 2015.

7.2.3 DWR and the SWRCB should establish an advisory group with other state agencies and stakeholders to identify and implement measures to reduce impediments to achievement of statewide water conservation, recycled water, and stormwater goals. This group should evaluate and recommend updated goals for additional water efficiency and water resource development.

7.2.4 DWR, the SWRCB, the CDPH, and other agencies, in consultation with the Delta Stewardship Council, should revise State grant and loan ranking criteria to be consistent with Water Code section 85021 and to provide a priority for water suppliers that includes an expanded water supply reliability element in their adopted urban water management plans, agricultural water management plans, and/or IRWM plans.

7.2.5 DWR and the USBR will complete the Bay Delta Conservation Plan (both the Habitat Conservation Plan/Natural Communities Conservation Plan and the Environmental Impact Report/Environmental Impact Statement), a 50-year ecosystem-based plan designed to restore fish and wildlife species in the Delta in a way that protects California's water supplies while minimizing impacts on Delta communities and farms. Upon adoption of the BDCP and receiving the necessary permits by the regulating agencies, DWR and the USBR will implement the 22 proposed conservation measures in the BDCP to help wildlife and reverse the decline of native fish populations in the Delta.

7.2.6 DWR, in coordination with the SWRCB, CDPH, Public Utilities Commission, Energy Commission, USBR, California Urban Water Conservation Council, and other stakeholders, should develop a coordinated statewide system for water use reporting. Water suppliers that export water from, transfer water through, or use water in the Delta watershed should be full participants in the database.

7.2.7 DWR, in consultation with the SWRCB and other agencies and stakeholders, should evaluate and include in the next and all future CWP updates information needed to track water supply

reliability performance measures identified in the Delta Plan, including an assessment of water efficiency and new water supply development, regional water balances, improvements in regional self-reliance, reduced regional reliance on the Delta, and reliability of Delta exports, and an overall assessment of progress in achieving the coequal goals.

7.2.8 Immediately provide financial incentives and technical assistance through the IRWM plans and the Local Groundwater Assistance Program to improve surface water and groundwater monitoring and data management.

7.3 Water quality in the Delta should be maintained at a level that supports, enhances, and protects beneficial uses identified in the applicable SWRCB or RWQCB water quality control plans.

7.3.1 The SWRCB should update the Bay-Delta Water Quality Control Plan objectives as follows:

A. By June 2, 2014, adopt and begin to implement updated flow objectives for the Delta that are necessary to achieve the coequal goals.

B. By June 2, 2018, adopt, and as soon as reasonably possible, implement flow objectives for high-priority tributaries in the Delta watershed that are necessary to achieve the coequal goals.

7.3.2 The SWRCB and RWQCBs should work collaboratively with DWR, DFW, and other agencies and entities that monitor water quality in the Delta to develop and implement a Delta Regional Monitoring Program that will be responsible for coordinating monitoring efforts so Delta conditions can be efficiently assessed and reported on a regular basis.

7.3.3 DFW and other appropriate agencies should prioritize and implement actions for non-native invasive species from the *Conservation Strategy for Restoration of the Sacramento–San Joaquin Delta Ecological Management Zone and the Sacramento and San Joaquin Valley Regions* (California Department of Fish and Game 2011).

PLACEHOLDER Table 8-7 Related Actions and Performance Measures for Objective 7 (Manage the Delta to Achieve the Coequal Goals for California)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 8 — Prepare Prevention, Response, and Recovery Plans

Prepare prevention, response, and recovery plans for floods, droughts, and catastrophic events to help residents and communities, particularly disadvantaged communities, make decisions that reduce the consequences and recovery time of these events when they occur.

An overall purpose of this objective is to prepare prevention response and recovery plans that coordinate the actions by State agencies, local governments, business and industry, and citizens.

The State Multi-Hazard Mitigation Plan (SHMP) is the official statement of California's statewide hazard mitigation goals, strategies, and priorities. Hazard mitigation can be defined as any action taken to reduce or eliminate long-term risk to life and property by natural and human-caused disasters. The SHMP classifies hazards into a hierarchy of primary impacts (earthquake, flood, wildfire); secondary impacts (vulnerable levees, landslides, tsunamis); climate-related hazards (drought, heat, severe storms); and other (terrorism, hazardous materials release, dam failure).

The hazards of floods and droughts have an obvious nexus to water planning. Other hazards, such as earthquakes and wildfire, have a less obvious nexus, but they can have impacts on and from water. As California grows, it faces the dual challenges of addressing vulnerabilities in the built and natural environment while accommodating growth and change in ways that avoid or mitigate future vulnerabilities.

Of these hazards, drought differs in the timing of the impacts. The impacts of drought are typically felt first by those most reliant on annual rainfall — ranchers engaged in dry land grazing, rural residents relying on wells in low-yield rock formations, or small water systems lacking a reliable source. Drought impacts increase with the length of a drought, as carryover supplies in reservoirs are depleted and water levels in groundwater basins decline. However, unlike earthquakes, fires, or floods, drought onset is slow, allowing time for water suppliers to implement preparedness and response actions to mitigate reductions in normal supplies.

Related Actions

8.1 Communities in floodplains should consider the consequences of flooding and should develop, adopt, practice, and regularly evaluate formal flood emergency preparedness, response, evacuation, and recovery plans (see Objective 6).

8.1.1 State government should assist disadvantaged communities located in floodplains to prepare for and recover from flood emergencies.

8.2 Water shortage contingency plans prepared as part of the 2015 urban water management plans should increase drought planning from a 3-year drought to a 4-year drought, until more accurate information is available.

8.3 By December 2014, DWR will update the California Drought Contingency Plan, which includes:

A. Articulation of a coordinated strategy for preparing for, responding to, and recovery from drought.
B. Assessment of state drought contingency planning and preparedness.
C. Description of State government's role and responsibilities for drought preparedness.
D. Identification of needed improvements for drought monitoring and preparedness.
E. Identification of measures to mitigate the economic, environmental, and social risks and consequences of drought events.
F. Assessment of and adaptation to the impacts of drought under existing and future conditions, including climate change.
G. Identification of needed improvements to real-time surface water and groundwater monitoring programs.
H. Identification of needed research in drought forecasting.
I. Identification of needed research of the indices and metrics for assessing the levels of drought.

8.4 DWR will work with the California Governor's Office of Emergency Services (Cal OES) to develop preparedness plans to respond to other catastrophic events, such as earthquakes, wildfires, chemical spills, facility malfunctions, and intentional disruption, which would disrupt water resources and infrastructure.

8.5 Cal OES, the California Governor's Office of Planning and Research (OPR), and the California Natural Resources Agency should lead an effort to update the State Emergency Plan and State Multi-

Hazard Mitigation Plan to strengthen consideration of climate impacts to hazard assessment planning, implementation priorities, and emergency responses.

8.6 Cal OES, DWR, and the Delta counties should work together to develop a catastrophic flood response plan for the Delta region. This plan should support an integrated response within the Delta and increase communication efforts between stakeholders and federal, State, tribal, local, and private agencies.

8.7 Cal OES will work with appropriate agencies to update the San Francisco Bay Area Catastrophic Earthquake Response Plan and incorporate lessons learned from the 2013 Golden Guardian exercise.

PLACEHOLDER Table 8-8 Related Actions and Performance Measures for Objective 8 (Prepare Prevention, Response, and Recovery Plans)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 9 — Reduce the Carbon Footprint of Water Systems and Water Uses

Reduce the carbon footprint of water and wastewater management systems by implementing the water-related strategies in the AB 32 Scoping Plan to mitigate greenhouse gas emissions.

According to the California Energy Commission, the end use of water is the most energy-intensive portion of the water use cycle in California. Approximately one-fifth of the state's electricity is used for water conveyance and distribution. In December 2008, the California Air Resources Board (ARB) approved the Proposed AB 32 Scoping Plan, which included six measures for reducing the energy intensity and resulting GHG emissions of water uses and water and wastewater management systems. These six measures were included as related actions in Update 2009.

In early 2013, ARB initiated activities to update the AB 32 Scoping Plan to evaluate the mix of AB 32 policies to ensure that California is on track to achieve the 2020 GHG reduction goal. The AB 32 Scoping Plan update will define ARB's climate change priorities for the next five years and lay the groundwork to reach post-2020 goals set forth in Executive Orders S-3-05 and B-16-2012. The AB 32 Scoping Plan update will highlight California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan (2008). It will also evaluate how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use.

It is anticipated that the revised measures related to water in the AB 32 Scoping Plan update will be incorporated as related actions under this objective as part of Update 2013. ARB's timeline for the AB 32 Scoping Plan update is to release a preliminary draft for public review and comment in mid-August 2013, then provide an updated Scoping Plan document to ARB for consideration in November 2013. Additional information is available on the ARB's Web site at: http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm.

Related Actions

[Note: These related actions are under development and will include actions and recommendations from the updated Water-Energy Team of the Climate Action Team (WETCAT) strategy when available.]

PLACEHOLDER Table 8-9 Related Actions and Performance Measures for Objective 9 (Reduce Energy Consumption of Water Systems and Uses)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 10 — Improve Data, Analysis, and Decision-Support Tools

Improve and expand data monitoring, management, analysis, and decision-support tools to advance IWM, in light of demographic, climate, and institutional uncertainties.

This objective and its related actions rely heavily on information contained in Chapter 6, "Integrated Data and Analysis." The related actions were informed by advice from the Statewide Water Analysis Network (SWAN), which serves as the technical advisory group for the CWP. SWAN consists of technical experts from federal, State, and local agencies; universities; non-governmental organizations; consultants; and tribes. Additional sources of information include the Update 2013 featured companion State plans described in Chapter 4, "Strengthening Government Alignment," particularly the Delta Plan from the Delta Stewardship Council and the recommendations from the Alluvial Fan Task Force. The actions were also informed by the CWP's State Agency Steering Committee, Public Advisory Committee, and Tribal Advisory Committee, as well as stakeholder input at workshops to discuss the Update 2013 objectives and related actions.

The related actions described here are intended to promote significant improvements in the way water managers develop and share water information by making data more accessible, supporting critical updates in analytical tools, and fostering collaboration around data and tools used to support policy decisions. California needs better data and analytical tools to produce useful and more integrated information to support IWM. Investment in our analytical capabilities lags far behind the growing challenges facing water managers. Significant new investment in our technical capabilities is needed to prepare for the impacts from extended droughts, flood events, and climate change, as well as to improve management of the Delta. Improving communication between technical experts and decision-makers goes hand in hand with improving our technical capabilities because sound technical information is critical to making robust policy decisions.

Related Actions

To develop and use analytical tools more effectively, DWR should take the following actions, in coordination with the SWRCB, CDPH, Public Utilities Commission, Energy Commission, USBR, California Urban Water Conservation Council, California Council for Science and Technology, IRWM Regional Water Management Groups, and other agencies, organizations, tribes, and stakeholders.

10.1 Expand the Central Valley Planning Area scale analytical tool and scenario studies developed during Update 2013 to assess future vulnerabilities and management responses in the other hydrologic regions for the California Water Plan Update 2018. The regional analytical tools and analysis should include evaluation of water supply reliability, water efficiency and new water supply development,

regional water balances, improvements in regional self-reliance, reduced regional reliance on the Delta, and reliability of Delta exports. Over time, these tools should be enhanced to include water quality, economic, and biological metrics, as well as to evaluate a greater number of the resource management strategies in Volume 3.

10.2 Develop a shared conceptual understanding, analytical framework, and quantitative description of how California watersheds and water management systems are represented in analytical tools at different spatial and temporal scales for use by federal, State, tribal, regional, and local agencies and organizations.

10.3 Support the California Water and Environmental Modeling Forum (CWEMF) in updating its 2000 modeling protocols and standards to provide more current guidance to water stakeholders and decision-makers, and their technical staff, as models are developed and used to solve California's water and environmental problems.

To improve water data and information, DWR should take the following actions, in coordination with the SWRCB, CDPH, Public Utilities Commission, Energy Commission, USBR, California Urban Water Conservation Council, California Council for Science and Technology, IRWM Regional Water Management Groups, and other agencies, organizations, tribes, and stakeholders.

10.4 Establish standards and protocols for data collection and management that facilitate sharing of information among agencies and modeling studies. This would include identifying and cataloging existing water data for California, creating a water data dictionary, and developing standards and metadata for water data monitoring, collection, and reporting.

10.5 Develop a strategic plan for data management that prioritizes long-term improvements in the monitoring network considering risk-based decision-making, and that identifies adequate resources for long-term maintenance and accessibility to water management information.

10.6 Improve drought planning and preparation by:

- 10.6.1 Developing drought metrics (indicators) with the goal of providing early detection and determination of drought severity.
- 10.6.2 Developing and improving monitoring of key indicators of regional water vulnerabilities.
- 10.6.3 Improving the system of stream gauging for the purpose of managing water resources in low-flow conditions and improving the accuracy of seasonal runoff and water supply forecasts.
- 10.6.4 Improving groundwater monitoring and assessment by providing technical and financial support to develop real-time monitoring of groundwater data.
- 10.6.5 Expanding the existing surface water and groundwater monitoring networks, where needed.

10.7 Develop a strategy and implementation plan for measuring and reporting water use and water quality data. The accurate measurement, timely publication, and broad distribution of water use and water quality will facilitate better water planning and management, especially in the context of managing aquifers more sustainably, and are necessary for the development of more accurate hydrologic budgets.

10.8 Sponsor science-based, watershed adaptation research and pilot projects to address water management and ecosystem needs, improve aquatic species and habitat monitoring, and develop an accessible and standardized database for reporting watershed and headwater conditions.

To improve data and information exchange, DWR should take the following actions, in coordination with the SWRCB, CDPH, Public Utilities Commission, Energy Commission, USBR, California Urban Water Conservation Council, California Council for Science and Technology, IRWM Regional Water Management Groups, and other agencies, organizations, tribes, and stakeholders.

10.9 Develop the Water Planning Information Exchange (Water PIE) to facilitate sharing data and networking existing databases among federal, State, tribal, regional, and local agencies and governments; nonprofit organizations; and citizen monitoring efforts. The Water PIE data framework will help improve analytical capabilities and develop timely surveys of statewide land use, water use, and estimates of future implementation of resource management strategies. Potential beneficiaries of Water PIE include urban water management plans, agricultural water management plans, groundwater management plans, IRWM plans, and the CWP.

10.10 Support establishment of an open, organized, and documented quantitative representation of the State's intertied water system to serve as a common and standardized data platform for model development and analysis by federal, State, tribal, regional, and local water planners.

10.11 Implement Shared Vision Planning or similar collaborative modeling approaches to integrate tried-and-true planning principles, systems modeling, and collaboration into a practical forum for making more informed and durable water resources management decisions.

PLACEHOLDER Table 8-10 Related Actions and Performance Measures for Objective 10 (Improve Data, Analysis, and Decision-Support Tools)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 11 — Invest in Water Technology and Science

Identify, develop, and prioritize research needs for new technologies; advance development and implementation of existing and emerging tools, technologies and innovations; and encourage partnerships in water-related technology and science to promote more efficient, effective, and sustainable water resources management and a better scientific understanding of California's water-related systems.

Federal, State, tribal, regional, and local governments; non-governmental organizations; California research and academic institutions; and private applied research and innovation initiatives should work together to identify, prioritize, and fund applied research projects. Specifically, research projects would involve the commercialization of new water technologies and advancement of cost and energy-efficient emerging tools and technologies. Such collaboration among the abovementioned organizations and entities will also encourage fuller implementation of existing, effective technologies — in support of more integrated, aligned, and sustainable water management.

The objective and related actions come out of an effort of the CWP Water Technology Caucus and the California Council for Science and Technology (CCST). The CWP Water Technology Caucus is a statewide topic-based workgroup designed to support development of Update 2013 through in-depth discussions and deliberations of innovation, applied research and development, and technology. The Water Technology Caucus helped identify and expand information associated with statewide and regional opportunities and challenges for implementing new water technologies in California. The statewide and regional information helps inform technology planning efforts, pilot projects, and investments by federal, State, tribal, regional, and local governments; non-governmental organizations; and private applied research and innovation initiatives. This collaborative process can lead to the commercialization of new water technologies; an enhanced focus on California water research, information, and data needs (see also Objective 10 — Improve Data, Analysis, and Decision-Support Tools); and a better scientific understanding of California's water-related systems. The Water Technology Caucus works closely with California research and academic institutions working on water technology initiatives to develop the water technology-related actions for Update 2013.

Innovations in science and technology have long been recognized as a key driving force of economic growth, especially in high-technology economies such as California's. However, State government has limited resources and is seeking ways to most effectively encourage and sustain an environment where innovation can flourish. In early 2012, the CCST initiated the California's Water Future Project to identify and describe technology innovation and/or systems approaches currently under development or available for application. These innovations can be used in California, on a statewide, regional, local, or project basis, for immediate adoption and within the next five to 10 years to enhance California's IWM; efficient water use; effective groundwater management; and environmental restoration and sustainable management, including optimization of river systems for state-determined goals. The project goals were to make specific recommendations regarding:

- Technologies that appear to have the most promise for California over the next 5-10 years.
- Policy and process changes needed to commercialize and more broadly deploy identified innovation.

The target audience for the California's Water Future Project is anyone in the science and technology community with an interest in water; DWR; and federal, State, and local policy-makers. Additional information on CCST's Water Future Project is available in Volume 4, *Reference Guide*.

State government will continue to work with California research and academic institutions — such as the California Academy of Sciences, California Council on Science and Technology, the University of California, California State University, and other universities and colleges — to identify and prioritize applied research projects leading to the commercialization of new water technologies and better scientific understanding of California's water-related systems.

Related Actions

11.1 Advance new water technology to improve Data Management and Modeling by implementing the following:

11.1.1 Development and implementation of a standardized protocol for water use and quality measurement and reporting strategy and implementation plan necessary for sustainable California water planning and management.

11.1.2 Development and compliance of protocol for distributed data storage and use policy with all database managers and with all data linked to the appropriate metadata.
11.1.3 Development of effective interactive database portals, such as Water PIE (DWR) and HOBBES (UC Davis), should continue with a high priority.
11.1.4 Support for the maintenance of current modeling protocols and standards that provide guidance to water stakeholders and decision-makers, and their technical staff, as models are developed and used to solve California's water and environmental problems. The California Water and Modeling Forum should continue to have a major role in this important effort.

11.2 Advance new water technology to improve both in situ (on-site) and remote sensing for data acquisition by implementing the following:
11.2.1 Developing closer coordination between in situ sensing and remote sensing.
11.2.2 Supporting technology fairs and/or other effective venues for presenting licensing opportunities for technology developed by the National Laboratories and other government agencies with technology development focused on the water environment.
11.2.3 Increasing the deployment of land based radar where local topographic features prevent adequate weather forecasting.

In situ (on-site) Data Acquisition: Priorities for in situ data acquisition technology research include:
11.2.4 Development is required of protocol for data acquisition and compatibility of associated equipment.
11.2.5 Development of cost effective sensors.

Remote Sensing Data Acquisition: Priorities for remote-sensing data acquisition technology research include:
11.2.6 Development and use of remote sensors capable of accurately determining qualitatively quantitatively more chemical and physical parameters for fresh water bodies.
11.2.7 Development of inexpensive, local remote sensors to replace or complement in situ sensors for the purpose of providing monitoring capability that is less susceptible to vandalism.
11.2.8 Continue the development of utilizing airborne drones to provide targeted data to complement satellite data (e.g., snowpack, reservoir level).
11.2.9 Increased partnerships between the National Aeronautics and Space Administration (NASA), state and private sectors to enhance existing resources while realizing savings by reducing duplicative monitoring and/or increasing required data acquisition opportunities.

11.3 Advance new water technology to improve efficiencies for the Water-Energy Nexus by implementing the following:
11.3.1 Smart grid technologies for water and energy conservation and management.
11.3.2 Use of renewable energy for water treatment and transport processes.
11.3.3 Developing anaerobic processes to facilitate energy recovery from supply and wastewater organic residuals.
11.3.4 Improve technology for residential use of point-of-use (POU) and point-of-entry (POE) treatment.

11.4 Advance new water technology to improve Membrane Water Treatment by implementing the following:

11.4.1 Further development of more robust, cost- and energy-efficient, general-purpose membranes for use in seawater desalination, brackish water treatment, and wastewater and water reuse applications, with removal of contaminants not now efficiently removed (e.g., boron, contaminants of emerging concern), and recovery of beneficial salts and minerals for reuse.

11.4.2 Further development of energy recovery technologies, particularly for high-pressure reverse osmosis units (e.g., operational pressure as high as 1,180 pounds per square inch gauge [psig], or 8 megapascals [MPa]) but also with application to separation technologies operating at lower pressures.

11.4.3 Further development of smart control technology that ensures more dependable operation of treatment facilities, including remotely located treatment facilities (distributed treatment).

11.4.4 Development of membrane separation technologies capable of reliable and economic deployment to remotely located communities (distributed treatment).

11.4.5 Significantly broadened deployment of brine disposal technologies for disposal into marine environments already used outside of California.

11.5 Advance new water technology to improve Biological Water Treatment by implementing the following:

11.5.1 Development and deployment of technologies focused on wastewater cleanup for recycling process and wastewater, including use as drinking water (i.e., drinking water, irrigation, process water, groundwater recharge).

11.5.2 Development of technologies to reduce chemical use and increase energy efficiency, such as engineered wetlands for wastewater treatment and ecosystem enhancement.

11.5.3 Technology development to support the increased use of affordable distributed biological water and wastewater treatment systems for small, rural communities.

11.5.4 Development of better control technology for biological treatment, similar to the earlier stated research priority for membrane separation technology.

11.6 Advance new water technology to improve watershed management by implementing the following:

11.6.1 Software development that leads to more effective combining and utilizing of applicable models, in recognition of the need for the effective management of the multiple factors affecting watersheds, including climate change impacts.

11.6.2 Improved data collection for surface-water and groundwater basin descriptive parameters, including water runoff and storage as a function of time throughout the basin by more extensive use of satellite monitoring, where applicable, and partnering with other agencies (i.e., DWR, SWRCB, U.S. Geological Survey, and others) where possible.

11.6.3 Expanded use of flood plains and other sites having good recharge potential for groundwater recharge.

11.7 Advance new water technology to improve Agricultural Water Use Efficiency by implementing the following:

11.7.1 Increase the adoption of field level water measurement (flow and total) and soil moisture-sensing technologies to increase water management accuracy and data.

11.7.2 Promote the use of high-efficiency water irrigation systems, provide necessary maintenance, and utilize proper irrigation scheduling methods to optimize water- and energy-use efficiency.

11.7.3 Increased adoption of one or more technologies for irrigation scheduling (e.g., including remote sensing, weather based, and/or crop/soil-based technologies).
11.7.4 Development of cost-effective irrigation system performance information monitoring platforms for evaluating irrigation performance criteria in real time.
11.7.5 Increase the number of water districts that provide water deliveries on a demand basis to maximize on-farm water use efficiency.
11.7.6 Use agricultural water and land whenever appropriate to provide local environmental benefits (e.g., flooded rice ground to provide seasonal wetlands for migratory birds and reproduction habitat for fish and aquatic life).
11.7.7 Identification of shared-use opportunities for water supplies (e.g., water exchanges between agricultural and urban users).

11.8 Advance new water technology to improve Urban Water Use Efficiency by implementing the following:
11.8.1 Metering infrastructure to promote more efficient water use (e.g., individual apartments, remote access to water use data).
11.8.2 Continued advancement of plumbing code and efficiency standards for low-flow appliances and fixtures, such as toilets and clothes and dish washers in the home and low-flow cleaning technologies in the commercial and industrial sectors.
11.8.3 Increased use of American Water Works Association water-loss software and verification program.
11.8.4 Greater use of low-water-use landscaping.

PLACEHOLDER Table 8-11 Related Actions and Performance Measures for Objective 11 (Invest in Water Technology and Science)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 12 — Improve Tribal/State Relations and Natural Resources Management

Develop relationships with California Native American Tribes that acknowledges and respects their inherent rights to exercise sovereign authority and ensure that they are incorporated into planning and water resources decision-making processes in a manner that is consistent with their sovereign status.

Update 2005 recommended that DWR and other State agencies invite, encourage, and assist the participation of tribal government representatives in statewide, regional, and local water-planning processes and to access State funding for water projects. As part of Update 2009, the Tribal Communication Committee prepared the comprehensive *Tribal Communication Plan* (Tribal Communication Committee 2008) for the CWP (as presented in Update 2009, Volume 4, *Reference Guide*). The 10 *Tribal Communication Plan* objectives were included in the Update 2009 related actions. (Refer to the *Tribal Communication Plan* for a definition of California Native American Tribes.)

For Update 2013, a Tribal Advisory Committee was convened, and a Tribal Water Summit for the update was held in April 2013. The summit included the development of the *Guiding Principles and Statement of Goals for Implementation*. This objective incorporates the related actions from Update 2009, the 2013

Tribal Water Summit *Guiding Principles and Statement of Goals for Implementation*, and the 2013 Tribal Water Summit implementation objectives.

Related Actions

12.1 The State, in collaboration with California Native American Tribes, should, where it is within the State's authority, address tribal water rights, including tribal water rights dating back to time immemorial; federally reserved water rights; jurisdiction; and trust responsibilities, including individual allotments, by:

- 12.1.1 Convening a task force to articulate a consistent State policy and protocol that recognizes tribal water rights in all aspects of water planning, including supply, timing, flows, quality, and quantity.
- 12.1.2 Bureau of Indian Affairs and SWRCB, in collaboration with California Native American Tribes, developing joint training on State, federal, and tribal water rights, including trust responsibilities, the implications for different tribal trust lands (reservations, rancherias, and individual allotments) and jurisdiction.

12.2 State government should write legislation and contracts in a way that enables California Native American Tribes to be a lead agency and directly receive and manage state funding (as fiscal agent or otherwise) for water planning and management.

12.3 DFW and California Native American Tribes will develop and initiate pilot projects to develop resource management plans, characterized by the integration of Traditional/Tribal Ecological Knowledge and western science. This will include identifying existing examples of partnerships and launching pilot projects.

12.4 State agencies should use Tribal Ecological Knowledge to inform their work and decisions, including establishing baseline resource conditions and developing options to share information in ways that protect specific details about cultural resources.

12.5 State agencies, in collaboration with California Native American Tribes, should develop and conduct trainings for agencies on tribal sovereignty, trust responsibilities, cultural awareness/sensitivity, and Traditional/Tribal Ecological Knowledge by developing a curriculum with a tribal working group, establishing consistent training protocols for all agencies, and initiating trainings.

12.6 State and federal agencies, in coordination with California Native American Tribes, should identify, coordinate, and provide technical training for California Native American Tribes, to increase technical capacity — including, but not limited to, basic training modules (e.g., Basic Inspector Academy, GIS, small water systems operations, such advanced technologies as LiDAR and satellite imagery) — and establish criteria and protocols for ensuring training vendors preferred by California Native American Tribes are utilized.

12.7 State agencies should engage tribal communities in compiling and developing climate change adaptation and resilience strategies that will mitigate climate impacts to their people, waterways, cultural resources, or lands.

12.8 The SWRCB should, in collaboration with California Native American Tribes, propose a statewide beneficial use definition that respects and acknowledges cultural and subsistence use of water and this definition should be adopted in statewide water quality control plans.

12.9 State agencies and California Native American Tribes should utilize and implement communication strategies, protocols, and procedures that are developed and/or implemented by California Native American Tribes, including but not limited to the Tribal Communication Plan, U.N. Declaration on the Rights of Indigenous Peoples, 2013 Tribal Water Summit Guiding Principles and Goals, and tribal memoranda of understanding.

12.10 State agencies, in collaboration with California Native American Tribes, should enhance tribal outreach, communication, coordination, collaboration, and the work of tribal liaisons by identifying and implementing strategies to strengthen tribal involvement in State outreach and engagement approaches; clarify tribal liaison roles and responsibilities; and identify options for creating a statewide network of tribal liaisons to address multiple aspects of tribal concerns (e.g., legal, policy, and local conditions).

12.11 State agencies should engage in meaningful consultation by encouraging and moving toward earlier involvement by California Native American Tribes (at the design/planning stages); initiating consultation for programmatic decisions as well as project-level decisions; understanding individual California Native American Tribes' protocol for consultation, adjusting timelines to allow adequate time to bring items before tribal councils and leaders; conducting meetings on tribal lands; and documenting tribal comments.

PLACEHOLDER Table 8-12 Related Actions and Performance Measures for Objective 12 (Improve Tribal/State Relations and Natural Resources Management)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 13 — Ensure Equitable Distribution of Benefits

Increase the voice of small and disadvantaged communities in State processes and programs to achieve fair and equitable distribution of benefits. Provide access to safe drinking water and wastewater treatment for all California communities and ensure programs and policies address the most critical public health threats in disadvantaged communities.

Update 2005 recommended that DWR and other State government departments and agencies should invite, encourage, and assist representatives from disadvantaged communities and vulnerable populations, and the local agencies and private utilities serving them, to participate in statewide, regional, and local water planning processes and to get equal access to State funding for water projects. State policy establishes social equity and environmental justice (EJ) as State planning priorities to ensure the fair treatment of people of all races, cultures, and income, in particular those having experienced significant disproportionate adverse health and environmental impacts.

To enforce the fair treatment clause, four key requirements must be met:

- Disadvantaged and disproportionately affected communities must be identified and engaged.

- The water-related needs of these communities must be identified, and potential solutions developed and funded.
- The impact of water management decisions on these communities must be considered and mitigated.
- All State programs must be evaluated to document progress.

A number of efforts to better address EJ and economically disadvantaged community concerns have advanced since Update 2005.

In 2008, the California Public Resources Code, Section 75005(g), was added to define a "disadvantaged community" (DAC) as a community with a median household income of less than 80 percent of the statewide average. A "severely disadvantaged community" is one with a median household income of less than 60 percent of the statewide average.

The current DWR guidelines for IRWM funding, allocated through voter-approved Propositions 84 and 1E, identify statewide priorities among which is a goal to "ensure equitable distribution of benefits." For implementation grants, DWR has prioritized proposals that:

- Increase the participation of small communities and DACs in the IRWM process.
- Develop multi-benefit projects with consideration given to affected DACs and vulnerable populations.
- Address safe drinking water and wastewater treatment needs of DACs.

In 2012, California Water Code Section 106.3 was added to declare that the established policy of the State recognizes every human being as having the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. All relevant State agencies, including DWR, SWRCB, and CDPH, are required to consider this State policy when revising, adopting, or establishing policies, regulations, and grant criteria when those policies, regulations, and criteria are pertinent to the uses of water described in this section.

Other initiatives have also moved forward, including:

- Final Report To The Governor's Office August 20, 2012, Governor's Drinking Water Stakeholder Group, Agreements and Legislative Recommendations.
- CDPH's Small Water System Program Plan.
- SWRCB's Small Community Wastewater Grant Program.

Even with all these efforts, one of the challenges that State agencies and water systems express about trying to address the needs of DACs is simply answering these two questions:"Who are they?" and "Where are they?"

The CWP can provide guidance and tools for identifying disadvantaged and EJ communities. It is vitally important to identify community needs. Most water, wastewater, and flood projects are not developed for these communities; and yet, they can affect them. It is important to understand that even projects that convey "general" public benefit may not proportionally benefit EJ communities or DACs. For example, conservation programs that depend heavily on toilet and washing machine rebates will have greater penetration in middle- and upper-class communities than they will in poorer communities that purchase

less frequently and cannot afford the initial outlay for the fixture. These problems are resolved by taking community concerns into account during the project design phase to ensure equitable benefits.

Another concept that plays into the measurement of impacts is the cumulative effects of a project. It is understandable that water agencies would look at other water projects in determining the impact of their project, but that practice ignores the reality of these communities. That is, these communities endure so many challenges on a daily basis, that one more, from any source, only adds to what may already be an excessive burden.

Finally, planners should develop multi-benefit projects with consideration given to affected DACs and vulnerable populations. This is particularly true in already affected communities. For example, if an agency is developing a flood management project, it would be prudent to look at developing the project in ways that will provide flood protection, as well as open space, wildlife habitat, and/or recreational opportunities, to DACs and vulnerable populations.

Related Actions

13.1 Ensure implementation of the policy goals of California Water Code Section 106.3 (AB 685), which state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.

- 13.1.1 State government should ensure that the goals established by the policy — safe, clean, affordable, and accessible water adequate for domestic uses — are reflected in agency planning.
- 13.1.2 State government should give preference to policies that advance the policy and refrain from taking actions that adversely affect the human right to water.
- 13.1.3 State government should report on actions undertaken to promote the policy and make information relevant to the human right to water available to the public.
- 13.1.4 State government should foster meaningful opportunities for public participation in agency decision-making by California's diverse population.
- 13.1.5 State government should facilitate access by rural and urban DACs to state funds for water infrastructure improvements.
- 13.1.6 State government should ensure the effectiveness of accountability mechanisms protecting access to clean and affordable water.

13.2 Increase EJ and DAC participation in planning.

- 13.2.1 DWR and the other CWP Steering Committee members should incorporate EJ issues of precautionary applications, cumulative health impact reductions, public participation, community capacity building and communication, and meaningful participation in current and future CWP Update processes and other programs.
- 13.2.2 DWR should require that grant and loan recipients conduct outreach to DACs and vulnerable populations and their advocates to seek their participation in water planning programs, including the CWP update, and IRWM plans and other local water planning processes.

13.3 Develop CWP goals and objectives, in coordination with IRWM partnerships, to resolve water-related public health issues in DACs.

13.3.1 California tribes, both recognized and unrecognized, should provide goals and objectives to protect tribal uses of water, especially those that affect the health of tribal members (see Objective 12).

13.3.2 DWR, DFW, and other State agencies should develop statewide goals and objectives for the provision of safe fish for communities that rely on fish as part of their subsistence diet.

13.3.3 DWR, in consultation with other State agencies, including the Department of Conservation, tribes, and community groups, should develop goals and objectives to restore and protect watersheds by making use of existing community-based watershed councils and groups under-utilized in maintaining and restoring California's water resources.

13.4 Support financial mechanisms to facilitate improved wastewater removal systems.

13.4.1 The SWRCB and DWR should establish incentives to support conversion to municipal or other upgraded wastewater removal systems.

13.4.2 The SWRCB and DWR should establish a process to create introductory, then graduated, wastewater rates to allow a period of adjustment for new fees.

13.5 Increase disadvantaged community access to funding.

13.5.1 The SWRCB, CDPH, DWR, and other State agencies should work with DACs and vulnerable populations and their advocates to review State government funding programs and develop guidelines that make funding programs equally accessible to DACs and EJ communities.

13.5.2 The SWRCB, CDPH, DWR, and other State agencies should work with DACs and vulnerable populations and their advocates to develop a technical assistance program to provide resources, expertise, and information to DACs and EJ communities to enable them to actively and equally participate in planning processes and access funding sources.

13.6 Provide incentives for the consolidation, acquisition, or improved management of small water systems.

13.6.1 CDPH should establish incentives to encourage consolidation with the "smalls" by the larger system. There are valid concerns on the part of the larger system when approached with the idea of acquiring small, dysfunctional systems.

13.6.2 CDPH should conduct outreach and education for customers and shareholders to a proposed consolidation to ensure informed decision-making.

13.6.3 CDPH should support efforts to improve licensing and training options for small water system operators.

13.7 CDPH should implement its Small Water System Program Plan to assist small water systems (especially those serving DACs) that are unable to provide water that meets primary drinking water standards.

13.7.1 CDPH should share the Small Water System Program Plan with relevant federal, State, and local agencies, as well as stakeholders, to foster additional opportunities for funding, coordinate construction projects in communities, and assist in local and regional planning efforts.

13.7.2 CDPH should utilize GIS tools to identify large water systems in close proximity to targeted small water systems, and conduct targeted outreach to these large water systems to encourage them to consolidate the small systems into their service area.

13.7.3 CDPH should work with stakeholders to identify obstacles to consolidation (including financial, legal, and local issues) and develop possible actions to address these obstacles.

13.7.4 CDPH should participate in statewide planning efforts to address the water infrastructure needs of small water systems. CDPH should seek input from other states and the federal government on innovative, successful efforts to address the needs of small water systems, and should share its results on implementation of it Small Water System Program Plan.

13.8 Collect and maintain data on EJ communities and DACs.

13.8.1 The SWRCB, CDPH, DWR, and other State and federal agencies should coordinate their review of current monitoring and regulatory programs to identify and address gaps in available data and monitoring programs that affect DACs and vulnerable populations.

PLACEHOLDER Table 8-13 Related Actions and Performance Measures for Objective 13 (Ensure Equitable Distribution of Benefits)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 14 — Protect and Enhance Public Access to the State's Waterways, Lakes, and Beaches

Protect and enhance public access to the state's waterways, lakes, and beaches for cultural, recreational, and economic purposes consistent with maintaining healthy ecosystems.

Public access to our natural waterways, lakes, and beaches has been embedded in the California's Constitution since the founding of the state. Activities such as boating, fishing, exploring the beach, and swimming are an important part of our heritage, our culture, our identity, and our economy. California's Legislature has repeatedly acknowledged the importance of developing the state's water resources to provide more public access and more recreational opportunities through our water supply, watershed protection, and flood management projects. The rich variety of recreation opportunities created by the state's natural, managed, and constructed water bodies supports public health and welfare, sustains healthy businesses and communities, and promotes wise use of our abundant natural resources. Critical to maintaining California's heritage is the need to protect and enhance public access to the state's waterways, lakes, and beaches for the foreseeable future. Doing so will require the development and implementation of related actions that guide decision-makers tasked with managing the state's waterways, lakes, and beaches.

The related actions below are a compilation of guidance from strategic planning documents for agencies as diverse as California State Parks, the Sierra Nevada Conservancy, and the Delta Stewardship Council. This is a new objective for the CWP, so it is expected that the related actions and performance measures will be more comprehensive as more agencies with public access responsibilities participate in the next CWP update. More information on this subject is available in Volume 3, Chapter 31, "Water-Dependent Recreation."

Related Actions

14.1 Respect and Protect. State government will respect and vigorously protect waterways, lakes, and beaches for beneficial public use.

14.1.1 The State will support the regulatory responsibilities of the California Coastal Commission (beach access), Bay Conservation and Development Commission (San Francisco estuary access), SWRCB (water quality and supply), State Lands Commission (navigation), DFW (inland fisheries), and others that protect beneficial uses such as fishing, boating, and other public access rights.

14.1.2 State conservancies — such as the Sacramento-San Joaquin Delta Conservancy, Tahoe Conservancy, and Sierra Nevada Conservancy — should acquire and/or protect sensitive landscapes, such as key watershed lands and wetlands, flood conveyance zones, riparian woodlands, and vernal pools with important natural resource and scenic values, and significant beneficial public uses. The conservancies, including the State Coastal Conservancy, should protect and/or acquire land to maintain public access to waterways, lakes, and beaches.

14.1.3 The State should protect recreational resource values threatened by the effects of climate change by using strategies of reinforcement, adaption, and/or retreat as feasible.

14.1.4 As water resources are developed, flood control facilities are envisioned, and sea level rise is accommodated, State government, including, but not limited to, DWR and the California Department of Transportation, will protect and minimize impacts on cultural and recreational uses.

14.2 Research and Planning. State government should engage in statewide research and planning to meet California's unmet and growing demand for safe public access to waterways, lakes, and beaches.

14.2.1 State government, such as the California Department of Parks and Recreation (California State Parks) and DWR, should document and regularly report on the water-dependent recreational trends of California's growing population, the public health and economic benefits of recreational activities, and threats to the tourism and lifestyle benefits of California's water-dependent recreational infrastructure.

14.2.2 State government, such as DWR, will report on the feasibility of incorporating public access facilities into each water resources development and flood management infrastructure project, watershed protection efforts, and environmental restoration projects funded by the State and federal governments. Consider multi-benefit projects that increase waterfront accessibility, create more inclusive access opportunities, support commercial and recreational fishing, encourage economic revitalization, promote excellence and innovation in urban design, enhance cultural and historic resources, and are resilient to a changing climate. Plan to include, where feasible, levee crown widening in levee improvement projects to accommodate multi-purpose recreational trails and bike lanes.

14.2.3 State conservancies, such as the State Coastal Conservancy, Bay Conservation and Development Commission, and California State Parks should collaborate with local agencies to systematically plan to reinforce, adapt, and/or relocate recreational opportunities threatened by sea level rise and transportation or wastewater infrastructure adaptations.

14.2.4 California State Parks should lead comprehensive recreation resource planning of the state's inland waterways, engaging the public, recreation providers, policy-makers, advocacy groups, and public officials. Consider facilities that provide opportunities for the top outdoor recreation activities identified in the *Survey of Public Opinions and Attitudes on Outdoor Recreation in California*, especially those benefiting disadvantaged communities.

14.3 Enhance. All State agencies with public access responsibilities should, in concert with local agencies, enhance safe public access by providing water-dependent recreational facilities and programs that support beneficial uses, and/or improve the social and economic sustainability of federally funded and State- funded infrastructure, watershed protection, and environmental restoration projects.

14.3.1 State government, including DWR, California State Parks, and all state conservancies, should facilitate and/or construct water-dependent recreation projects that spur the economic development of disadvantaged communities, provide environmental stewardship benefits, enhance natural resource values, protect or relocate existing recreational opportunities, and meet the regional demand for healthy outdoor recreation opportunities for all Californians, especially children.

14.3.2 The Delta Protection Commission and Sacramento-San Joaquin Delta Conservancy should encourage partnerships between other State and local agencies, local landowners, and business people to expand water-dependent recreation and tourism in the Delta and Suisun Marsh, while minimizing adverse impacts on non-recreational landowners. Use California State Parks' *Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun Marsh* and the Delta Protection Commission's *Economic Sustainability Plan* as guides.

14.3.3 As California's population increases, State government, such as DWR, DFW, and California State Parks, should increase water-dependent recreation opportunities on existing public land, where feasible. State government should also pursue acquisition opportunities that provide open space and public access to water features, such as the ocean, lakes, rivers, streams, and creeks, where demand exceeds supply.

14.3.4 State agencies should prioritize construction of water-dependent recreation facilities identified in IRWM plans; active-use facilities, such as multi-use trails for equestrians, hikers, walkers, and bikers, which improve public health; boating trails; facilities that mitigate or adapt to climate change; facilities that increase the safety of anglers, swimmers, and boaters; and facilities that provide environmental education, such as water conservation and water quality information.

14.4 Promote. All State agencies with waterfront public access responsibilities should cooperate with local agencies, businesses, and the general public to promote healthy outdoor recreation, resource-based tourism, and environmental stewardship to benefit public health and welfare, improve the environment, and grow the economy commensurate with protection of public property rights.

14.4.1 All state conservancies, DWR, DFW, and California State Parks should improve outreach and education to children and in disadvantaged communities that will improve public health, support California's outdoor lifestyle, and promote wise use of water resources.

PLACEHOLDER Table 8-14 Related Actions and Performance Measures for Objective 14 (Protect and Enhance Public Access to the State's Waterways, Lakes, and Beaches)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 15 — Strengthen Alignment of Land Use Planning and Integrated Water Management

Strengthen the alignment of goals, policies, and programs for improving local land-use planning and IWM.

The way in which we use land has a direct relationship to water supply, water quality, flood management and hazard mitigation, and other water topics. For example, compact urban development patterns in urban areas can reduce water demand, improve water quality, limit the amount of development in floodplains, reduce costs for water-related infrastructure, and reduce GHGs. Also, directing development away from agricultural lands allows for multi-objective management of those lands, which includes agricultural preservation, floodplain management, water quality improvement, and habitat conservation.

Cities and counties have primary responsibility for land use planning and regulation in California. Land use planners consider water throughout the local land-use planning process, and water is a critical element in adopting sustainable land-use planning policies. Stronger collaboration between land use planners and water planners can promote more sustainable land-use patterns and greater integration of IWM into local land-use plans. It can also lead to IRWM plans that more accurately reflect and support local government land use and growth policies.

State government has an important role to play in strengthening the alignment of land use and IWM. Existing programs include SB 610 and SB 221 of 2001, which establish processes for coordinating land use and water supply planning. Also, State flood legislation enacted in 2007 requires local general plans to include specific policies to reduce flood risk. Established in 2008, the Strategic Growth Council awards grants for sustainable communities planning, which can integrate IWM at both the regional and local levels.

By enhancing its role, State government can facilitate stronger collaboration between land use planners and water planners. It can provide additional regulatory and financial incentives for local and regional plans that integrate IWM through encouraging compact, sustainable development patterns. Finally, State government can provide technical tools and data resources to make it easier for local governments to prepare land use plans that integrate IWM.

Related Actions

15.1 State Government should provide additional regulatory and financial incentives to developers and local governments to plan and build using compact and sustainable development patterns.
- 15.1.1 Regulatory incentives include further streamlining of CEQA review for infill projects and further reductions in brownfields liability for innocent purchasers.
- 15.1.2 Financial incentives include developing criteria for state grant and funding programs that incentivize compact and sustainable development.

15.2 The OPR should provide guidance and financial incentives for integration of IWM issues in general plan updates and Sustainable Communities Strategy (SCS), including both substantive and planning process guidance.

15.3 Local governments should integrate relevant IWM issues into their general plan updates. IWM issues relevant to land use planning include water supply, water quality, flood risk management, and climate policies (mitigation and adaptation).

15.4 The Strategic Growth Council should provide guidance and financial incentives for regional planning agency integration of relevant IWM issues into SCSs, transportation blueprint plans, and other regional plans.

15.5 Regional planning agencies should integrate IWM issues into their SCSs, transportation blueprint plans, and other regional plans.

15.6 Local governments should ensure that urban water management plans inform and reflect IRWM plan preparation and implementation, to further IWM integration in local land-use planning that promotes compact and sustainable development.

15.7 Local governments should implement specific land-use planning and regulatory measures to reduce flood risks, consistent with IWM principles and BMPs for land use planning.

15.7.1 Measures include preservation of existing floodplains, aquifer recharge areas, and alluvial fans; restoration of natural floodplain functions; and design measures to increase post-flood resiliency. See Objective 6, Related Action 6.8 regarding the process for developing land use planning BMPs.

15.8 DWR should assist local governments and developers with implementing the *Integrating Water and Land Management: A Suburban Case Study and User-Friendly, Locally Adaptable Tool*, which calculates life-cycle water infrastructure costs for different development patterns.

15.9 State government should evaluate the effectiveness of the 2007 flood management legislation in achieving coordination of land use planning, flood planning, and natural resources. State government should recommend changes to existing laws and their implementation to increase their effectiveness as appropriate.

15.10 State government should evaluate the effectiveness of SB 610 and SB 221 in achieving coordination of land use and water supply planning. State government should and recommend changes to existing laws and their implementation to increase their effectiveness in achieving objectives, as appropriate.

15.11 State government should invest in innovation and technology for assessment of land use, water supply, and flood conditions to further integrate water management and land use.

15.11.1 The State should provide funding, technical information, and BMPs, and publicize accurate and relevant water resources information for use by local governments and developers. The State could serve as an information clearinghouse for regional water supply, water quality, flood management, and climate change vulnerability information that local governments can use in preparing general plans and evaluating development applications.

PLACEHOLDER Table 8-15 Related Actions and Performance Measures for Objective 15 (Strengthen Alignment of Land Use Planning and Integrated Water Management)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 16 — Strengthen Alignment of Government Processes and Tools

Improve, align, and transform processes and administrative tools (incentives and oversight) — at all levels of government — used for water planning, public engagement, program/project implementation, and policy- and regulation-setting to advance IWM.

As water managers move to IWM, regulatory and other requirements designed to achieve actions with a single management objective can appear to work at cross purposes. Multi-benefit projects may require complex considerations that balance needs and trade-offs. In addition, IWM project implementers often report that they must navigate what seems to be a labyrinth of laws, regulations, and permits that

sometimes leads to project delays and mounting planning and compliance costs. These impediments can ultimately create significant difficulties in meeting public safety, environmental stewardship, or economic goals. This objective seeks to establish an approach to assist in aligning activities, honor regulatory goals, and facilitate successful implementation of projects.

The need for improved government alignment is being recognized at all levels of government and in multiple planning processes. For example, the Strategic Growth Council, California Water Commission, Resource Conservation Districts, Water Plan State Agency Steering Committee, California Biodiversity Council, and IRWM Regional Water Management Groups all have stated that the following issues impede broader and better implementation of IWM projects:

- Uncoordinated and fragmented water governance and responsibilities among numerous federal, tribal, State, and local agencies and organizations.
- Patchwork of unaligned agency planning, programs, projects, policies, and regulations.
- Unintended consequences from mismatching or conflicting policies or regulations.
- Inadequate sharing of data, information, and knowledge resulting from institutional silos.
- Duplication of effort, expertise, and resources.
- Focus on single-purpose projects.
- Inadequate partnerships among federal, State, tribal, local, private, and non-profit organizations.
- Project delays and mounting planning and compliance costs.

Understandably, project planning in California is technically complex and location-appropriate because of wide variations of climates, landforms, and institutions, as well as a diverse, place-based range of cultures associated with rural, suburban, and urban communities. Project partners, such as implementers and regulatory agencies, may have different perspectives on what they hope a project or program should achieve. Those responsible for operations and maintenance may have yet another perspective. Also, State and federal agencies may have different perspectives and responsibilities regarding a project.

The need for alignment is well understood among all levels of government and stakeholders. This CWP objective of strengthening agency alignment is based on several key principles:

- Agencies will remain autonomous.
- Action will be voluntary.
- No new institutions or organizations will be created to manage alignment.
- Action will occur at multiple organizational levels.
- No single agency can solve all of a project's or program's issues by itself.

Implementing the related actions for this objective, in coordination with other CWP objectives, will help achieve the following outcomes:

- Improved communication, coordination, and collaboration.
- Aligned planning, programs, projects, policies, and regulations for water and associated watershed, land, and ecosystem management.
- Shared processes, tools, data, information, knowledge, and expertise.
- Collaborative, place-based solutions using best available science, traditional knowledge, and other sources of information.
- Watershed-scale, multi-benefit water and resource stewardship programs to solve multiple resource issues.

- More public-private partnerships to advance all aspects of IWM (planning, project implementation, financing, monitoring, maintenance, data collection and exchange, analytical methods and tools, research, technology, and science).

A primary purpose for improving communication, cooperation, collaboration, and alignment among government agencies is to expedite efficient and cost-effective implementation of resource management strategies and multi-objective projects. This includes collaboration with regulatory agencies to reduce time and avoid costs to implement IWM projects while protecting and enhancing natural resources. Achieving IWM requires that data management, planning, policy-making, and regulation occur in a very collaborative, consistent, and regionally appropriate manner.

Instead of creating new institutions or organizational structures to manage alignment, agencies are encouraged to utilize simple self-organizing principles, practices, and tools to coordinate and collaborate outside of traditional silos and hierarchical management approaches. Alignment should not alter agencies' authority or responsibility, and is achieved by agencies working together — early and often. For example, a collaboration has been established between the 42-member California Biodiversity Council (www.biodiversity.ca.gov) and the Update 2013 process to better align planning processes and more efficiently interact with federal, State, and local agencies. One result was a joint convening of the Workshop to Align Agency Conservation Plans, Policies, and Programs held in October, 2012. The outcome of this workshop led to the February 6, 2013, California Biodiversity Council Meeting in Davis, California, where the co-chairs committed to a new resolution for the Council, *Strengthening Agency Alignment for Natural Resource Conservation,* described further in Chapter 4, "Strengthening Government Alignment."

One of the related actions offers strategies for improving the alignment, effectiveness, and implementation of water regulations. It recommends agencies set regulations that focus on regionally appropriate outcomes (goals or targets — the What), establish performance measures/indicators to evaluate progress, and include an adaptive management approach as a part of compliance. The action also recommends that the regulatory agency give regional collaboratives, such as the IRWM Regional Water Management Groups or Resource Conservation Districts, an option to develop an implementation and monitoring plan that describes the resource management strategies the group will use to achieve the regulations' intended outcomes in their area of the state (the How).

Related Actions

16.1 To advance IWM, federal, State, tribal, and local government agencies should strengthen alignment among their data, plans, programs, policies, and regulations. More specifically, they should:

16.1.1 Collaborate to develop consistent policies for advancing IWM at a regional scale, and use a broad and diverse mix of administrative tools to implement their policies, including technical assistance and data support; financial incentives; and State funding, guidelines, and regulations.

16.1.2 Adopt the "Strengthening Agency Alignment for Natural Resource Conservation" resolution (April 2013) vision, goals and principles, developed with extensive input from 42 federal and State agencies, including multiple Water Plan State Agency Steering Committee members, among others.

16.1.3 Utilize the best practices and tools recommended in the "Strengthening Agency Alignment for Natural Resource Conservation" resolution.

16.1.4 Participate on the Biodiversity Council's Interagency Alignment Team.

16.2 State government should more effectively coordinate the work of multi-agency collaboratives, and utilize them to align and implement State water policies and promote IWM. This should include developing and maintaining a shared and easily accessible interagency inventory/repository of processes and tools for strengthening government agency alignment. Examples of multi-agency collaborative include, but are not limited to, the Strategic Growth Council, California Biodiversity Council, Delta Stewardship Council, Ocean Protection Council, Water Plan State Agency Steering Committee, Conservancies and Resource Conservation Districts, California Council on Science & Technology, and California Landscape Conservation Cooperative.

16.3 State government agencies should hire, assign, or train staff with collaboration and conflict resolution knowledge, skills, and abilities (KSA), whose primary job is to work with other federal, State, tribal, regional, and local agencies, organizations, and communities to improve interagency communication, cooperation, collaboration, and alignment.

16.3.1 California Department of Human Resources (Cal-HR) should convene an interagency working group to develop standard language describing collaboration and conflict resolution KSAs for use in duty statements where this core competency is a minimum qualification.

16.3.2 State agencies should include this standard KSA language in duty statements for staff and management classifications to promote State agency collaboration and alignment, and they should require incumbents in these classifications to complete facilitation training.

16.4 Federal and State government agencies should use a more inclusive, collaborative, and outcome-based approach for setting consistent and aligned water policies and regulations that are regionally appropriate. More specifically, they should:

16.4.1 Recognize regional and local diversity by assisting, enabling, and empowering regional water collaboratives, such as Regional Water Management Groups (IRWM) and Resource Conservation Districts, to determine *how* State water policies are implemented in their planning regions and/or watersheds.

16.4.2 Focus on intended and regionally appropriate outcomes (goals and objectives) when setting water policies, regulations, guidelines, and resource management plans for California. Agencies should establish performance measures/indicators to evaluate progress toward achieving desired outcomes, and include an adaptive management approach as a part of regulatory compliance.

16.4.3 Provide a voluntary program for regional collaboratives, such as Regional Water Management Groups (IRWM) and Resource Conservation Districts, to develop an implementation and monitoring plan that describes the resource management strategies (actions) the group will implement to achieve the regulations' intended outcomes in their planning regions and/or watersheds, as appropriate for their local conditions and resources.

16.4.4 Utilize voluntary, outcome-based and system-scale (watershed and ecosystem) approaches for regulatory and permitting processes, and engage project proponents collaboratively, earlier and more often during the process.

16.4.5 DWR and other State agencies should survey regional collaboratives, such as Regional Water Management Groups (IRWM), to determine what technical assistance they need to facilitate collaboration and support change in regulatory approaches.

16.5 The State should convene regulatory working groups, in collaboration with federal, tribal, and local governments, to improve and streamline regulatory review and permitting processes for implementing IWM projects more expeditiously. These regulatory working groups should take the following actions in collaboration with regional stakeholders, while recognizing the unique differences among California's geographical regions:

- 16.5.1 Identify critical resource needs of regulatory agencies necessary to adequately implement regulatory programs and proposed regulatory alignment actions to support IWM, including science, tools, data, policy, guidance, and agency personnel.
- 16.5.2 Maximize the use of existing mechanisms such as habitat conservation plans and natural community conservation plans.
- 16.5.3 Review and streamline permit processes to improve efficiency and reduce costs, delays, inconsistencies, and associated adverse impacts, and develop regional permitting processes for recurrent actions and operation and maintenance activities.
- 16.5.4 Develop and adopt region-specific guidance on ecosystem restoration, water quality improvement, and environmental stewardship strategies to expedite review.
- 16.5.5 Develop and adopt specific guidance to expedite emergency response and public safety projects for high-risk areas.
- 16.5.6 Evaluate and adjust regulatory staff assignments to improve regulatory review and permitting processes at a regional scale, facilitate earlier staff involvement in planning phases for complex projects, and identify resource gaps.
- 16.5.7 Compile, maintain, and utilize regional knowledge bases (data, information, and science), including information on endangered species, sensitive habitat, water quality, and other baseline information.
- 16.5.8 Develop and maintain regional environmental mitigation databases and mitigation banks to address the varying mitigation requirements among multiple regulatory programs and agencies in each region and across regions.
- 16.5.9 Develop a multi-agency permitting guidebook that includes a description of the relevant permits, permit applications, and permitting guidance for common and more routine IWM projects.

PLACEHOLDER Table 8-16 Related Actions and Performance Measures for Objective 16 (Strengthen Alignment of Government Processes and Tools)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Objective 17 — Improve Integrated Water Management Finance Strategy and Investments

State government uses consistent, reliable, and diverse funding mechanisms with an array of revenue sources to support statewide and regional IWM activities. State government also makes future investments in innovation and infrastructure (green and grey) based on an adaptive and regionally appropriate prioritization process.

This objective and the related actions are based on collaboration involving several State agencies, advisory committees, topic-based caucuses (particularly the Update 2013 Finance Caucus), and other CWP stakeholders who, together, developed a Finance Planning Framework (Framework), a new feature of the CWP. The Framework provides a logical structure and sequence for financial plan development. The related actions in this section were developed to respond to and leverage the challenges and

opportunities that emerged during the Update 2013 finance planning effort, as detailed in Chapter 7, "Finance Planning Framework."

The scope of the related actions is limited to IWM programs and projects directly administered by the State, as well as future State IWM loans and grants distributed as incentives to regional and local governments. These actions are intended to inform and guide State government investment and finance. They are not intended to direct regional or local finance decisions. They also are not intended to modify existing State investment frameworks for ongoing financial activities, such as distribution of currently authorized General Obligation bonds. While the actions below include recommendations for enhancing the way the State invests in IWM, they do not include recommendations for new revenue sources. Chapter 7 and related action #7 provide a path for resolving issues and filling information gaps, which is required as a precursor to proposing new or enhanced revenues.

Continuing to use and advance the Update 2013 Framework will enable stakeholders to collectively and in context consider the issues to be addressed and the decisions to be made. The Framework discussed in Chapter 7 evolved as stakeholders worked together to create a common understanding of California's water financing picture. Using a storyboard format, the goal was to establish a financing baseline and shared meaning about the past and current situation.

The related actions, shown in Table 8-17, are intended, in part, to incorporate several aspects of the Framework in State government actions. For example, the Shared Finance Values for State Investment and Prioritization have been represented, where appropriate. These values were developed collaboratively through the Update 2013 Finance Caucus and, in addition to guiding the development of the related actions (Table 8-17), are to be used in guiding IWM decisions regarding investment of State government funds. Another overlying purpose of these related actions is to increase the certainty that investments will achieve the intended benefits, improve the return on State investment, and enhance accountability by:

- Increasing the reliability, predictability, and level of State IWM funding for statewide and regional water programs and projects.
- Providing a consistent method for allocating, awarding, and disbursing State funding for water innovation and infrastructure programs and projects.
- Using competitive incentive programs instead of funding earmarks.
- Including regional accounts to continue IRWM to increase flexibility, reflect local and regional conditions, and advance regional goals and investment priorities.
- Providing proactive planning that implements consistent rules and standards for allocating State funding.

Related Actions

17.1 **Regional and local entities should continue investing in IWM activities based on regional and local conditions, goals, priorities, and solutions.**

Reliable and effective water finance planning should continue at the regional and local levels in partnership with State government. Locally sponsored initiatives will continue to be a cost-effective approach for planning and implementing IWM innovation and infrastructure (green and grey) to provide multiple benefits to their respective jurisdictions. Regional and local investments should be augmented and amplified with federal and State public funding.

17.2 **State government should continue to provide incentives for regional IWM (IRWM) activities that achieve State goals or provide broad public benefits.**

This includes assisting regions technically and financially to implement their IRWM plans and/or help achieve State government goals and interests. State government should continue to enhance incentives for regional activities and invest in infrastructure (green and grey) that provides a public benefit *and* would not otherwise be cost effective.

17.3 **State government should improve and facilitate access to federal and State public revenue sources.**

17.3.1 State government should develop a central online resource catalog to describe different funding programs, potential IWM revenue sources, and a how-to guide explaining how to apply for funding from these programs.

17.3.2 State government should provide guidance and assistance to local agencies on how to apply for funding that includes technical and financial assistance, as well as training for regions that do not have the capacity or resources to apply for funding or manage grants.

17.3.3 State government should inventory federal funding sources and provide guidance for partnering with, or leveraging, federal funding.

17.4 **The governor and the Legislature should broaden the ability of (and create guidelines and limitations for) public agencies to partner with private agencies, entities, and organizations for IWM investments.**

New policies are required to overcome the following limitations that have restricted their use:

17.4.1 Private financing rates are generally higher due to tax effects. Local bond financing options would typically be tax exempt for the bondholder and therefore have lower interest rates.

17.4.2 The prohibition of their use for State government projects restricts public-private partnerships (P3s) to local projects.

17.5 **State government should develop a more reliable, predictable, and diverse mix of finance mechanisms and revenue sources to continue to invest in IWM innovation activities and infrastructure (green and grey) that have broad public benefits, including, but not limited to, General Funds and General Obligation bonds.**

An important role of State government is to invest in innovation activities having broad public benefits that include improving State water governance, improving water planning and public engagement, investing in infrastructure (green and grey), strengthening government agency alignment, enhancing information technology (data and analytical tools), and advancing the use of water technology and science. These activities should be conducted in collaboration with the ongoing regional and local innovation activities.

Finance mechanisms used for these IWM innovation activities should:

A. Improve cost effectiveness, efficiencies, and accountability.
B. Avoid stranded costs and funding discontinuity.
C. Leverage funding across State government agencies.
D. Increase certainty of desired outcomes.
E. Enable prioritization based on shared funding values, defined principles, goals, objectives, and criteria.

17.6 **State government should reduce planning and implementation time frames and costs associated with IWM activities by clarifying, aligning, and reducing redundancies among State government agencies' policies, incentive programs, and regulations.**

17.6.1 Develop the scope and methodology and prepare a R*eturn on State Government Investment* report card through the CWP update collaborative process (5-year interval) that would track the occurrence of benefits/value derived from State government investments (and leveraged local investments) by using specific criteria and sustainability indicators.

17.6.2 Convene an interagency IWM finance alignment group that includes State planning, resource management, and regulatory agencies to identify and implement finance policies, procedures, and protocols for the enhancement of State government transparency, accountability, flexibility, and cost efficiencies. This effort would recommend ways to reduce duplication and fragmentation among State government agencies' policies, incentive programs, regulations, and budgets.

17.7 **The California Water Plan Update 2018 process will refine and advance the eight components of the Finance Planning Framework as described in the "Next Steps" section of Chapter 7, "Finance Planning Framework."**

Future work will cover each component of the Framework in the following ways:

A. **IWM Scope and Outcomes (Component 1)** — Revisit, clarify, and adapt the scope of IWM to changing conditions and priorities.

B. **IWM Activities (Component 2)** — Develop more specificity regarding the types of activities that State government should invest in with a clearer nexus to the types of anticipated benefits.

C. **Existing Funding (Component 3)** — Continue to compile and synthesize data that tracks historical water-related expenditures across federal, State, and local governments in California.

D. **Funding Reliability (Component 4)** — Work with the State Agency Steering Committee to identify where potential funding gaps exist between the State IWM activities described in component 2 and existing funding levels and sources. Collaborate with regional water management groups to do the same for regional and local IWM activities.

E. **State Role and Partnerships (Component 5)** — Continue to clarify and elaborate on the future role of State government to support a more specific description and estimate of future costs.

F. **Future Costs (Component 6)** — Estimate future funding demands by (a) launching IRWM, city, county, and special district data pull; and (b) work with State Agency Steering Committee to estimate the funding demand for existing and future IWM activities.

G. **Funding, Who and How (Component 7)** — Continue to collaborate with stakeholders and federal, State, tribal, and local governments to investigate and develop solutions that address the facts and findings detailed in Chapter 7, "Finance Planning Framework." This work will include, but will not be limited to:

i. Funding methods that provide a consistent financing framework for State government investments in IWM.

ii. A prioritization method and rationale for apportioning IWM investment by the categories and subcategories developed in the Update 2013 Finance Planning Framework (i.e., Innovation, Infrastructure).

iii. Methods for enhancing stewardship of State government monies at both statewide and regional scales, including strategies to improve the transparency and accountability of State fund disbursements.

iv. Achieve the improvements described in related action #5.

H. **Trade-Offs (Component 8)** — State government should develop a Decision Support System (DSS) to provide guidance and leadership for defining uncertainties of future cost, benefits, prioritization, and other tradeoffs. The DSS would inform prioritization of State government expenditures, estimation of expected IWM benefits, and methods for apportioning costs across financiers. It also includes developing a clear and consistent methodology for identifying public benefits associated with the entire range of IWM activities.

PLACEHOLDER Table 8-17 Related Actions and Performance Measures for Objective 17 (Improve Integrated Water Management Finance Strategy and Investments)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

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Table 8-1 Related Actions and Performance Measures for Objective 1 (Strengthen Integrated Regional Water Management Planning)

[table to come]

[These related actions are under development and will include actions and recommendations from the IRWM Strategic Plan, when available.]

Table 8-2 Related Actions and Performance Measures for Objective 2 (Use and Reuse Water More Efficiently)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
2.1 The State should expand public information efforts to promote water conservation in both the urban and agricultural sectors to better inform all Californians about the importance and value of water and about ways to use water more efficiently. The expanded campaign should be designed with specific informational goals and objectives and should operate on a continuous basis in wet years as well as dry years. This campaign will assist local water suppliers and the State in achieving the 2020 water use targets.	A. DWR and ACWA prepare expanded "Save Our Water" campaign plan, including both traditional and social media forums. Use advertising industry measures and metrics to develop and achieve informational and educational goals. B. Conduct a series of annual regional and crop specific water management workshops in cooperation with California academic institutions, such as the University of California and California State University, and resource conservation districts to provide growers the latest information on new irrigation technology and practices.	DWR and ACWA	Partially Funded	Yes for additional funding
2.2 DWR, with the California Urban Water Conservation Council (CUWCC) and the State Water Resources Control Board (SWRCB), should research and promote water rate structures that provide conservation price signal to customers while maintaining revenue stability for the water utilities.	A. Provide financial and technical support to the CUWCC for the development of one or more computer-based tools that could be used by water supplier staff. B. Provide technical support for communicating the benefits of alternate water pricing strategies.	DWR	Unfunded	
2.3 DWR, with the SWRCB and CDPH, should prepare a California Municipal Water Recycling Strategic Plan to guide expanded statewide use of recycled water to help sustain statewide water supplies. The strategic plan will include: 2.3.1 Review and status of implementation of the 2003 Recycled Water Task Force findings. 2.3.2 Regional assessment and quantification of current and proposed recycled water capacities and demands. 2.3.3 Evaluation of better alignment of the level of treatment required for recycled water use in agricultural and environmental applications to create more opportunities for recycled water use and reduce the energy required to produce recycled water.	A. Establish a stakeholder committee, including SWRCB, CDPH, water suppliers, organizations, and the public. B. Prepare a review and status of the C. 2003 Recycled Water Task Force findings and recommendations. D. Prepare regional assessments for each hydrologic region identifying regional strategies, such as institutional issues, costs, water quality, and markets E. Compile identified barriers to expanding local	DWR	Unfunded	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
2.3.4 Consideration of potential groundwater degradation issues and coordination with Salt and Nutrient Management Plan implementation. 2.3.5 Regional evaluation of barriers to additional recycled water use and proposing solutions, including indirect and direct potable reuse issues, to support continued expansion of recycled water use.	and statewide recycled water use. F. Identify regional and statewide tools for local water suppliers to guide implementation of recycled water programs. G. Identify improved practices for implementing 'fit for use' measures into recycled water planning. H. Prepare final report (2015)			
2.4 The State should establish a water use efficiency and alternative supply research program to speed the development, testing, and implementation of promising new technology and approaches to water management. The program should conduct studies in all sectors of water use including agriculture, municipal and industrial, and in the alternative supply areas of recycling, greywater, stormwater capture, and desalination. The level of sponsored research should match that of the State's energy-use efficiency research programs.	A. Research program established B. Quantity and quality of research similar to energy use efficiency programs C. Research results in improved California water management.	DWR, SWRCB and others entities.	Unfunded	
2.5 DWR should research and assist water suppliers in using new tools to measure landscape area. The landscape area data can be used to establish water budgets for customer accounts. Water suppliers can use the water budget program to better focus their water conservation efforts toward customers who are using excess water.	DWR helps identify cost effective landscape area measurement tools.	DWR	Unfunded	
2.6 DWR, in cooperation with urban water-use community, should conduct a study to identify the barriers, costs, and technical assistance required to establish standard urban water-use classifications for water use reporting. The standard classifications would allow for water supplier data to be more accurately aggregated at the regional and statewide levels and permit a more detailed and accurate reporting of California water use.	A. DWR conducts the classification study, barriers, costs and potential solutions for implementation are identified. B. Standard classifications implemented.	DWR	Unfunded	
2.7 Agricultural and urban water suppliers should report water supply system leakage and spills in their water management plans. Agricultural suppliers should measure and report canal seepage and	Urban and agricultural water suppliers report distribution system leakage and spills and unaccounted for water in their 2015 water	DWR	Partially Funded	X

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
district outflows. Urban water suppliers should calculate and report unaccounted-for distribution system water.	management plans.			
2.8 All levels of government should establish policies and provide incentives to promote better urban runoff management and reuse. Urban and, where feasible, rural communities should invest in facilities to capture, store, treat, and use urban stormwater runoff, such as percolation to usable aquifers, underground storage beneath parks, small surface basins, in drains, or the creation of catch basins or sumps downhill of development. Depending on the source and application, captured stormwater may be suitable for use without additional treatment, or it may be blended to augment local supplies.	Implementation of low impact development increases significantly across the state	SWRCB	Partially Funded	

Table 8-3 Related Actions and Performance Measures for Objective 3 (Expand Conjunctive Management of Multiple Supplies)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
3.1 Promote public education about California's groundwater.	By July 1, 2016, DWR and SWRCB will work with other State, tribal, local, and regional agencies and organizations to develop a groundwater education program and materials for use in the schools and public outreach. Key educational concepts should include: A. Groundwater supply variability. B. Interconnection of surface water and groundwater. C. Groundwater recharge benefits and challenges. D. Importance of protecting groundwater quality and recharge areas. E. Seasonal versus long-term changes in groundwater quantity. F. Importance of developing a groundwater budget. G. Potential impact of climate change on groundwater resources.	DWR & SWRCB	Unfunded	
3.2 Improve collaboration and coordination among federal, State, tribal, regional, and local agencies and organizations to ensure data integration, coordinate program implementation, and minimize duplication of efforts.	By January 1, 2017, and on an ongoing basis, DWR and the SWRCB will coordinate with State, federal, tribal, local, and regional agencies and organizations to conduct the following activities. A. Provide State incentives to local water management agencies to coordinate with Tribes and other agencies involved in activities that may affect long-term sustainability of water supply and water quality. B. Outline and implement process to improve coordination and cooperation among State, federal, tribal, and local agencies to improve	DWR, SWRCB, & local permitting agencies	Unfunded	X

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	the process for timely regulatory approval, alignment of rules or guidelines, and environmental permitting for the development, implementation, and operation of conjunctive management, recharge, and water banking facilities. C. Expedite environmental permitting for implementation of conjunctive management, recharge, and water banking facilities when facility operations increase ecosystem services, and includes predefined benefits/mitigation for wildlife and wildlife habitat. D. Establish a process led by the SWRCB to identify measures whereby agencies proposing to use peak surface water flow for groundwater recharge are not subject to potential protest of their existing water right, in order to stipulate groundwater recharge as a reasonable beneficial use of their surface water right.			
3.3 Increase availability and sharing of groundwater information.	DWR will coordinate with State, federal, tribal, local, and regional agencies and organizations to conduct the following activities. A. By January 1, 2016, Governor's Office of Planning and Research (OPR) will develop a coordination plan to disseminate groundwater information. B. By January 1, 2016, the State of California will consider changes to Section 13752 of the California Water Code to improve public access to Well Completion Reports, while addressing key infrastructure security and private ownership concerns. C. By January 1, 2018, State agencies will work collaboratively with water agencies, local permitting agencies, and driller organizations	DWR, SWRCB, & OPR	Unfunded	X

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	to 1) develop an on-line Well Completion Report submittal system, 2) digitize and make publically available existing Well Completion Reports groundwater to allow improved analysis of groundwater data, and to 3) build upon efforts begun in 2012 to update well drilling, construction, and abandonment standards. D. By December 31, 2018, DWR will work with SWRCB to implement a web-based Water Planning and Information Exchange (Water PIE) system that will provide on-line access to groundwater supply and demand information, groundwater level and quality data, groundwater recharge and conjunctive management activities, groundwater management planning, land subsidence information, and groundwater basin studies.			
3.4 Strengthen and expand the California Statewide Groundwater Elevation Monitoring (CASGEM) Program for its long-term sustainability.	A. By January 31, 2015, and renewable in each five-year cycle ending in 8 and 3, the State of California will commit long-term, dedicated funding to the CASGEM Program to implement monitoring, assessment, and maintenance of baseline groundwater levels data, and expand the program to include the fractured rock hydrogeology in areas deemed important. B. By January 31, 2015, and renewable in each five-year cycle ending in 8 and 3, the State will continue funding for local groundwater monitoring and management activities, and feasibility studies that increase the coordinated use of groundwater and surface water by giving priority to projects that include filling regional and Statewide data	DWR	Unfunded current limited funding ends June 30, 2014	X (Fractured rock areas not currently in Water Code)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	gaps and conjunctive management conducted in accordance with an IRWM plan. Thus encourage or require and provide incentives to local water management agencies to implement groundwater monitoring programs to provide additional data and information needed to adequately characterize a groundwater basin, subbasin, aquifer or aquifers under the jurisdiction of the agency or adopted groundwater management plan. C. By December 31, 2018, the State will expand and fund CASGEM by including and implementing above recommendations as integral components of the Program, and thus use CASGEM as the vehicle to update and maintain groundwater information in the future.			
3.5 Under the CASGEM Program, improve understanding of California groundwater basins by conducting groundwater basin assessments of CASGEM high-priority basins in conjunction with the CWP 5-year production cycle.	By December 31, 2018, DWR will coordinate with State, federal, tribal, local, and regional agencies to utilize the CASGEM Basin Prioritization information to conduct the following groundwater basin assessment activities. A. Develop the initial and reoccurring schedule and scope for groundwater basin assessments that will allow data and information sharing under the CWP five-year production cycle. B. Compile and evaluate new and existing groundwater supply and demand information, groundwater level and quality data, groundwater recharge and conjunctive management activities, surface water/groundwater interaction, groundwater management planning, land subsidence	DWR	Unfunded	X

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	information, and existing groundwater basin studies, in accordance with the scope identified in (a). C. Develop detailed groundwater basin assessment reports by Hydrologic Region and groundwater basin. The reports will characterize sustainability of groundwater resources in terms of historical and existing trends, and future scenario projections, and will identify recommended incentives to establish basin-wide water budgets and adaptive management practices which will promote sustainable groundwater quantity, quality, and the maintenance of groundwater ecosystem services. D. Develop a summary report to California Legislature identifying the *State of California's Groundwater* which will highlight key findings and recommendations associated with detailed groundwater basin assessments by Hydrologic Region.			
3.6 Conduct an assessment of all SB 1938 groundwater management plans and develop guidelines to promote best practices in groundwater management	In coordination with State, federal, tribal, local, and regional agencies, DWR will conduct the following activities. A. By January 1, 2015, the Legislature will amend the appropriate code(s) to authorize DWR to evaluate and assess groundwater management and planning, and to develop groundwater management and implementation guidelines. B. By January 1, 2016, DWR will conduct outreach to local and regional agencies to	DWR	Unfunded	X

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	supplement and verify Groundwater Management Plans (GWMP) inventory and information initiated by DWR as part of Water Plan Update 2013. C. By January 1, 2017, DWR will work with regional and local agencies to assess their GWMP implementation and practices, in accordance with existing California Water Code requirements to i) identify technical, legal, institutional, physical, and fiscal constraints associated with existing groundwater management programs, ii) identify opportunities associated with groundwater management and planning activities, and iii) gain an understanding of how agencies are implementing actions to use and protect groundwater. D. By January 1, 2018, DWR will work with regional and local agencies to develop groundwater management and planning and program implementation guidelines. The guidelines will provide a clear roadmap for GWMP development and implementation by identifying and clarifying components, processes, and standards and by establishing provisions for periodic review, report, update, and amendment as necessary to facilitate effective and sustainable groundwater management. The guidelines will also emphasize groundwater management in coordination with or as part of an IRWM plan. E. By December 31, 2018, DWR will develop a GWMP Advisory Committee and begin coordination with regional and local agencies and tribal communities that have not developed basin-wide GWMPs, to develop			

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	such plans with assistance and guidance from the GWMP Advisory Committee. The GWMP Advisory Committee will help guide the development, educational outreach, and implementation of the GWMPs. Advanced tools development should be pursued as part of this activity to help quantify benefits and assess robustness of alternative management strategies.			
3.7 Develop analytical tools to assess conjunctive management and groundwater management strategies.	By December 31, 2018, DWR and the SWRCB, in collaboration with State, federal, tribal, local, and regional agencies will conduct the following activities. A. Develop a conjunctive management tool that will help identify conjunctive management opportunities (projects) and evaluate implementation constraints associated with the i) availability of water for recharge, ii) available means to convey water from source to destination, iii) water quality issues, iv) environmental issues, v) jurisdictional issues, vi) costs and benefits, and vii) the potential interference between a proposed project and existing projects. B. The State will encourage or require local and regional agencies to develop or adopt analytical tools to support integrated groundwater/surface water modeling and scenario analysis for assessing alternative groundwater management strategies as part of their IRWM planning activities.	DWR & SWRCB	Unfunded	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
3.8 Increase statewide groundwater recharge and storage by two (2) million acre-feet (maf) (current average annual statewide groundwater use is about 16 maf).	In coordination with State, federal, tribal, local, and regional agencies, the following activities will occur. A. By January 1, 2016, the Legislature revises the Water Code to i) include disincentives to overdraft groundwater basins and ii) include incentives for increasing recharge. B. By January 1, 2017, DWR will compile, assess, and provide status update on Statewide aquifer recharge area delineation and mapping required by AB 359 and to identify priority recharge areas. C. By January 1, 2017, State agencies will work with federal, Tribal, local, and regional agencies to i) develop guidelines clarifying interagency alignment and improved interagency coordination to facilitate local groundwater recharge and storage projects, ii) develop guidelines for coordinating and aligning land use planning with groundwater recharge area protection, and iii) catalogue best science and technologies applied to groundwater recharge and storage. D. By January 1, 2018, DWR and SWRCB will compile available data, identify missing data needed to evaluate natural groundwater recharge, discharge, related ecosystems, and groundwater recharge and storage projects, and develop a plan to fill identified data gaps to support evaluation of groundwater recharge and storage. E. By January 1, 2018, and on an ongoing basis, the State of California will encourage local and regional agencies - when technically, legally, and environmentally feasible – to manage the use of available	DWR & SWRCB	Unfunded	X

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	aquifer space for managed recharge and develop multi-benefit projects that generate source water for groundwater storage by capturing water not used by other water users or the environment. F. By December 31, 2018, the State of California will encourage and fund local and regional agencies, and tribal communities to i) identify and evaluate local and regional opportunities to reduce runoff and increase recharge on residential, school, park, and other unpaved areas, ii) coordinate groundwater recharge and multi-benefit flood control projects to enhance recharge using storm flows, and iii) conduct pilot studies (one regional and one inter-regional) to identify additional opportunities and needs for advancing recharge opportunities.			
3.9 Evaluate reoperation of the state's existing water supply and flood control systems.	In collaboration with willing participants, DWR will complete a System Reoperation Study by 2015. The study will evaluate and document the potential options for reoperation of the State's existing water supply and flood control systems to achieve the objectives of improved water supply reliability, flood hazard reduction, and ecosystem protection and enhancement. The reoperation options will focus on integrating flood protection and water supply systems, reoperating the existing water system in conjunction with effective groundwater management, and improving existing water conveyance systems.	DWR	Full	X
3.10 DWR and the U.S. Bureau of Reclamation (USBR) should: 3.10.1 Complete the North-of-the-Delta Offstream Storage, Shasta Lake Water Resources, and Upper San Joaquin River Basin Storage investigations.	Progress on completing: (A) the North-of-the-Delta Offstream Storage, Shasta Lake Water Resources, and Upper San Joaquin River Basin Storage investigations by the end of 2015, (B) the investigation of the further enlargement of the Los Vaqueros Reservoir by the end of 2016, (C) the San Luis	DWR & USBR	Partially Funded	X

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
3.10.2 Complete the investigation of the further enlargement of the Los Vaqueros Reservoir. 3.10.3 USBR, in collaboration with DWR, should complete an investigation to enlarge/raise BF Sisk Dam and San Luis Reservoir.	Reservoir expansion investigation by the end of 2016. The above projects will also: A. Evaluate the potential additional benefits of integrating operations of new storage with proposed Delta conveyance improvements, and recommend the critical projects that need to be implemented to expand the State's surface storage. B. Identify the beneficiaries and cost share partners for the non-public benefits by 2015. C. Request funding from the water bond for the public benefits portion through the California Water Commission by 2016, if a State water bond passes in 2014			

Table 8-4 Related Actions and Performance Measures for Objective 4 (Protect and Restore Surface Water and Groundwater Quality)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
4.1 Protect and restore surface water quality by implementing strategies to protect the past, present, and probable future beneficial uses for all 2010-listed (Clean Water Action Section 303[d]) water bodies by 2030.				
4.1.1 Implement a statewide strategy to efficiently prepare, adopt, and implement total maximum daily loads (TMDLs), which result in water bodies meeting water quality standards, and adopt and begin implementation of TMDLs for all 2010-listed water bodies by 2019.				
4.1.2 Manage urban runoff volume to reduce pollutant loadings, reduce wet weather beach postings and closures by 75 percent by 2020, eliminate dry weather beach closures and postings and, where applicable, promote stormwater capture and re-use for development of sustainable local water supplies.				
4.1.3 Take appropriate enforcement actions and innovative approaches as needed to protect and restore the beneficial uses of all surface waters.				
4.2 Protect and restore groundwater quality by improving and protecting groundwater quality in high-use basins by 2030.				
4.2.1 Communities should implement an integrated groundwater protection approach to improve and protect groundwater in high-use basins that:				
A. Evaluate and regulate activities that impact or have the potential to impact beneficial uses.				
B. Recognize the effects of groundwater and surface water interactions on groundwater quality and quantity.				
C. Encourage and facilitate local management of groundwater resources.				
4.2.2 State government should identify strategies to ensure that communities with contaminated groundwater have a clean and reliable drinking water supply, which may include remediation of polluted or contaminated groundwater, surface water replacement, and/or groundwater treatment.				
4.2.3 State government should implement the recommendations in the SWRCB's Report to the Legislature on addressing issues associated with nitrate contaminated groundwater.				
4.2.4 The SWRCB and Regional Water Quality Control Boards (RWQCBs) should maintain high-quality groundwater basins through application of antidegradation directives using waste discharge requirements (WDRs) and the remediation of				

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
polluted or contaminated groundwater. 4.2.5 Regional and local stakeholders should prepare salt and nutrient management plans for each groundwater basin/subbasin in California by 2016. These salt/nutrient management plans should be prepared as outlined in the SWRCB's Water Quality Control Policy for Recycled Water adopted May 14, 2009, the purpose of which is to increase the use of recycled water from municipal wastewater sources that meets the definition in California Water Code section 13050(n), in a manner that implements State and federal water quality laws. The RWQCBs should incorporate salt and nutrient management plans into basin plans, where appropriate. 4.3 Comprehensively address water quality protection and restoration, and the relationship between water supply and water quality, and describe the connections between water quality, water quantity, and climate change, throughout California's water planning processes. 4.3.1 As part of the CWP, the SWRCB should prepare a comprehensive water quality policy to guide the State's water management activities, including protection and restoration of water quality through the integration of statewide policies and plans, regional water quality control plans (basin plans), and the potential effects of climate change on water quality and supply. 4.3.2 RWQCBs should consistently organize basin plans to provide a clear structure that readily conveys key elements (e.g., beneficial uses, potential impacts of climate change, water quality objectives, goals for watersheds, plans for achieving those goals, and monitoring to inform and adjust the plans) and that fully integrates other water quality control plans such as the California Ocean Plan and Water Quality Control Plan for Enclosed Bays and Estuaries. 4.3.3 RWQCBs should adopt basin plan amendments through a collaborative process that involves third parties and incorporates SWRCB requirements and stakeholder interests. An example is the Santa Ana RWQCB's Basin Plan amendment initiated with funding assistance from stakeholders as required in the SWRCB's Recycled Water Policy. 4.3.4 State Government should continue to support efforts of the California Water Quality Monitoring Council to develop a centralized Geographic Information System (GIS) database (EcoAtlas) that displays watershed information including watershed boundaries, TMDLs, monitoring data, water body types, assigned BUs, wetlands, California Rapid Assessment Method scores, vegetation types, and other data. A key component of effective water quality planning is access to pertinent watershed information so that regulatory				

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
actions can strategically protect and improve watershed aquatic resources.				
4.4 To protect source water and safeguard water quality for all beneficial uses, State government should implement the recommendations from the following CWP Resource Management Strategies found in Volume 3: pollution prevention, matching water quality to use, salt and salinity management, urban stormwater runoff management, groundwater/aquifer remediation, recharge area protection, municipal recycled water, and drinking water treatment and distribution.				
4.5 CDPH will continue to implement its Small Water System Program Plan to assist small water systems (especially those serving disadvantaged communities) that are unable to provide water that meets primary drinking water standards.				
4.5.1 CDPH will share the Small Water System Program Plan with relevant federal, tribal, State, regional, and local agencies, as well as stakeholders, to foster additional opportunities for funding, coordinate construction projects in communities, and to assist in local and regional planning efforts.				
4.5.2 CDPH will utilize GIS tools to identify large water systems in close proximity to targeted small water systems, and conduct targeted outreach to these large water systems to encourage them to consolidate the small systems into their service area.				
4.5.3 CDPH will work with stakeholders to identify obstacles to consolidation (including financial, legal, and local issues) and develop possible actions to address these obstacles.				
4.5.4 CDPH will participate in statewide planning efforts to address the water infrastructure needs of small water systems. CDPH should seek input from other states and the federal government on innovative, successful efforts to address the needs of small water systems, and should share its results on implementation of it Small Water System Program Plan.				

Table 8-5 Related Actions and Performance Measures for Objective 5 (Practice Environmental Stewardship)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
5.1 Governments and the private sector should work together to create and maintain a network of protected reserve areas across the state that builds on existing conservation investments, and provides refuge areas and migration corridors that allow species to adjust to conditions associated with climate change. The network should include river corridors that connect high elevations to valleys and reestablish natural hydrologic connections between rivers and their historic floodplains. (California Natural Resources Agency 2009) 5.1.1 The California Natural Resources Agency should develop and implement a comprehensive tracking system to identify the lands that already are protected and lands that are a priority for protection.	A. Cumulative number of acres protected in each eco-region. B. Connectivity score of areas protected in each eco-region. C. Percentage completion of a tracking system of lands that are a priority for protection.	Natural Resources Agency	Partially Funded	
5.2 All agencies that own and operate water and flood management systems should include actions in their respective natural resource management plans that restore natural processes of erosion and sedimentation in rivers and streams and increase the quantity, diversity, quality, and connectivity of riverine and floodplain habitats. Local planning activities, including integrated regional water management (IRWM), urban water management plans, watershed management plans, natural community conservation plans, habitat conservation plans, and other water resource or floodplain focused planning efforts, should include objectives to meet these goals. 5.2.1 Re-establish one million acres of contiguous natural riparian, wetland, and floodplain habitat that is subject to periodic flooding for at least 50 percent of the river miles in the regions. This can contribute to Assembly Bill (AB) 32 GHG reduction goals through enhanced carbon sequestration. IRWM and regional flood management plans that incorporate corridor connectivity and restoration of native aquatic and terrestrial habitats to support increased biodiversity and resilience to a changing climate should receive additional credits in State government water and flood grant programs. (See objectives 1, 2, and 6)	A. Number of acres of riparian and floodplain habitat restored annually. B. Number of acres of floodplain and upper watershed forest restored annually. C. Annual increase in number of plans that offer additional credits for habitat corridor connectivity and restoration. D. Percentage achievement of overall one-million acre goal.			
5.3 State and federal governments should encourage, prioritize, and identify financing for actions to protect, enhance, and restore at least one million acres of upper watershed forests and meadows that act as natural water and snow storage. These	A. Number of acres newly protected or treated for			

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
actions should include efforts to reduce the risks and impacts of catastrophic wildfire. This measure improves water supply reliability, protects water quality, safeguards high-elevation habitats, and supports carbon sequestration and forest-based economies. (See objectives 1, 3, and 4.) (Association of California Water Agencies 2013; California Air Resources Board 2008)	fire risk each year. B. Percentage achievement of protecting, enhancing, and restoring one-million acres of upper watershed forests and meadows.			
5.4 Governments and the private sector should develop and support programs that pay private landowners and managers to protect and improve habitat and nature's water-related services, including flood protection, water quality, groundwater recharge and storage, reversal of land subsidence, prevention of large wildfires, shading of rivers and streams, and reduced soil erosion.	Number of acres newly enrolled each year; total acreage enrolled		Unfunded	
5.5 Governments and the private sector should work to incorporate the economic value of nature's goods and services into natural resource management decisions. Such recognition should include development of ways to measure the economic value of those services and the financial return from investment in their protection and enhancement.	A. Number of economic metrics developed for nature's goods and services B. Number of State programs (e.g., grants, mitigation, CEQA guidelines) that incorporate metrics	Natural Resources Agency	Unfunded	
5.6 Federal, state, and local agencies should provide greater resources and coordinate efforts to control invasive species and prevent their introduction. (California Department of Fish and Game 2007)	Progress toward decreasing trends in the number, abundance, and distribution of invasive species.			
5.7 State and federal government should work with dam owners/operators, tribes, and other stakeholders to evaluate opportunities and technologies to reintroduce anadromous fish to upper watersheds. Re-establishment of anadromous fish upstream of dams may provide flexibility in providing cold water downstream in conjunction with water and flood systems reoperation strategies. The State and federal governments should develop funding sources to support partnerships in constructing fish passage at dams and to assist removal of obsolete dams that pose a public safety and ecological risk.	Number of evaluations completed each year		Partially Funded	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
5.8 State, federal, and local government should identify and prioritize protection of lands of San Francisco Bay and the Delta that will provide the habitat range for tidal wetlands to adapt to and shift with sea level rise. A climate change resilient San Francisco Bay and Delta should include creating greater flood capacity by construction of setback levees on islands and removal of strategic island levees that also creates opportunities for tidal wetland and riparian restoration. Such lands and actions can help maintain estuarine ecosystem functions and act as storm buffers, protecting people and property from flood damages. (San Francisco Estuary Partnership 2007)	A. Number of acres of potential tidal wetland identified and prioritized for protection each year B. Total acreage so enrolled			
5.9 State government should prioritize and expand Delta islands and Suisun Marsh subsidence reversal and land accretion projects to help reestablish equilibrium between land and estuary elevations. Sediment-soil accretion is a cost-effective, natural process that can help sustain the Delta and Suisun Marsh ecosystem, and reduce communities' risks from flooding, as well as sequester carbon and restore estuarine ecosystem functions.	A. Number of acres newly enrolled in subsidence reversal projects each year B. Total acreage so enrolled			
5.10 State and federal government should fund natural resource protection agencies to continue work to determine fishery needs and provide funds for water right holders to meet those needs.	A. Progress towards developing statewide priorities for flow studies. B. Progress towards completing flow criteria for high priority watersheds. C. Amount of funding spent or made available to purchase water rights. D. Progress towards meeting target conditions for fish in priority streams. E. Progress towards meeting population targets for fish affected by these programs.			

Table 8-6 Related Actions and Performance Measures for Objective 6 (Improve Flood Management Using an Integrated Water Management Approach)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
6.1 Agencies at all levels should utilize IWM principles that consider flood risk, mitigation, and protection of natural floodplain functions for planning and implementing flood management projects. Collaborate with planners, engineers, scientists, regulators, and other stakeholders to identify flood risk reduction and floodplain restoration strategies that can be used in local and regional planning efforts such as general plans, regional economic and transportation plans, resource conservation plans, floodplain management plans, and others. This should include best management practices (BMPs) for coastal zones, alluvial fans, headwaters, and riverine floodplains in urbanized and non-urbanized areas.	Number of flood management plans and projects utilizing IWM principles completed.	S/F/L agencies	Partially Funded	
6.2 The State should prepare an update to the 2013 California's Flood Future Report: Recommendations for Managing the State's Flood Risk (California's Flood Future), which further advances the recommendations developed as part of the original California's Flood Future effort.	California's Flood Future Update	State (DWR)	Partially Funded	
6.3 Local agencies should work together in regions to develop regional flood risk assessments to evaluate potential adverse impacts of flooding on life, property, infrastructure, the environment, and the economy. The risk assessments should be developed through regional collaboration among local, state, and federal stakeholders, and based on a consistent methodology, appropriate to the region, for flood risk assessment. This assessment should include a determined acceptable level of flood risk for people, property, and the environment within the region. The flood risk assessments should include a set of digital maps for planning and communication of flood risk to agencies, the public, elected officials, and other stakeholders.	Population, total area, and number of regions covered by initiated or completed flood risk assessments with digital maps	Local agencies	Unfunded	
6.4 The State should develop comprehensive economic evaluation guidance for flood risk assessment and other flood management activities. The economic evaluation guidance should include methods to evaluate ecosystem services and other IWM benefits and should be adaptable to different areas of the state.				
6.5 Local agencies should work together regionally to develop regional flood risk management plans based on regional risk assessments and define short-term and long-term goals, objectives, actions, and associated implementation strategies for reducing flood risk, as well as define opportunities to enhance natural floodplain functions and provide other IWM benefits. These plans should reflect a collaborative, stakeholder-based process addressing the unique regional and statewide interests,	Population, total area and number of regions covered by initiated or completed regional and statewide floodplain management plans	Local FM agencies	Partially Funded	Potentially

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
critical needs, and priorities. These plans should address, as appropriate: the locally identified level of flood protection; flood risk and flood damage reduction and mitigation strategies, including natural floodplain function; operations and maintenance; and local, regional and state IWM strategies.				
6.6 The State should work with federal and local agencies to develop a statewide flood management investment approach. This approach would evaluate short- and long-term financing needs, as well as available investment strategies, and should layout potential future investment alternatives for flood management statewide. This action will also be informed by the outcomes of Objective 17.	Completion of statewide flood management investment approach	State (DWR)	Partially Funded	
6.7 The State should take appropriate action to facilitate revenue generation and support regional flood risk management. This includes as evaluation of existing financing mechanisms and legal frameworks to facilitate the development of regional flood-risk reduction financing.	White paper review of financial mechanisms and potential legislation changes	State		Potentially
6.8 The State should work with stakeholders to develop BMPs for land use planning that achieve flood risk reduction and protection of natural floodplain functions. The State should collaborate with planners, engineers, scientists, regulators, and other stakeholders. BMPs should be developed for local planning (e.g., general plans, land use regulations) that is conducted by cities and counties and for regional planning (e.g., sustainable communities strategies and blueprint plans) that is conducted by regional planning agencies. Land use planning BMPs should be developed for coastal zones, alluvial fans, headwaters, and riverine floodplains in urbanized and non-urbanized areas.	Initiation or completion of best management principles; number of workshops with land use planning stakeholders	State (DWR)		
6.9 The State should work with federal and local agencies to develop a comprehensive regional vulnerability analysis approach and set of regional adaptation strategies for climate change impacts on flood risk and floodplain ecosystems.	Climate change adaptation strategies for flood risk	State (DWR)		

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
6.10 The State should create and coordinate statewide and regional environmental regulatory working groups to improve and streamline regulatory review processes that will address critical flood risk reduction projects, flood system maintenance, flood emergency response, and floodplain restoration (see Objective 16). State and federal environmental regulatory agencies, in collaboration with regional stakeholders, should take actions to streamline regulatory review while recognizing the unique differences among geographical regions of the state.	A. Number of regions with working groups and number/ types of environmental permitting processes reviewed, number and type of activities approved under the new processes with historical comparison B. Regional and/or statewide guidance for water quality and ecosystem restoration C. Number of regions and list of regulatory agencies engaging in baseline data sharing; D. Number of regions and list of agencies adopting a regional mitigation database and mitigation bank E. Permitting Guidebook	State (DWR)		
6.11 The State should develop a comprehensive set of materials and tools to assist public agencies in obtaining accurate information on flood risk and floodplain conditions and increase public awareness of flood risks and potential IWM solutions in that region. The State should develop regional and statewide indicators of flood risk and floodplain conditions and create online regional and statewide flood risk and floodplain information resources for government agencies and for the public. These resources should include regional maps with information on flood risk and floodplain conditions and indicators; outreach and communication tools, including tailored outreach materials as needed to meet the unique needs of each region; and materials that clarify the roles and responsibilities of local, state and federal agencies in flood risk reduction and floodplain restoration efforts, including emergency response.	Catalog of floodplain maps; library of outreach materials; regional outreach materials	State (DWR)	Partially Funded	
6.12 The State should increase support for flood emergency preparedness, response, and recovery programs to reduce flood risk by identifying data and forecasting	Number of exercises and pre-planning meetings with locals; List	State (DWR)	Partially	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
needs; conducting statewide flood emergency management (EM) exercises; working with locals to improve flood EM plans; and support increased coordination between flood EM responders, planners, facility managers, and resource agencies. (See Objective 8).	of agencies and type of staff attended meetings		Funded	
6.13 In June 2012, the Central Valley Flood Protection Board adopted the first Central Valley Flood Protection Plan (CVFPP). Prepared by DWR, the plan presents a long-term vision for improving integrated flood management in the Central Valley and achieving a more flexible, resilient, and sustainable flood management system over time. In implementing this vision, the State should take the following actions consistent with the goals of the CVFPP: 6.13.1 Update the CVFPP in years ending in 2 and 7. 6.13.2 Continue to work with local and regional entities and the federal government to plan and refine physical improvements to the State Plan of Flood Control. 6.13.3 Periodically update the Flood Control System Status Report (FCSSR), which provides information on the current status and conditions of State Plan of Flood Control facilities. 6.13.4 Continue to develop criteria and guidance to assist local cities and counties in demonstrating an urban level of flood protection consistent with State law. 6.13.5 Continue to develop policies, guidance, and funding mechanisms to implement flood management projects by using an IWM approach in the Central Valley. 6.13.6 Continue to develop guidance and take actions to support wise management of floodplains and residual flood risks present in floodplains protected by the State Plan of Flood Control.	Completion of CVFPP and FCSSR Status Report Updates ULOP guidance published	State (DWR)	Full	
6.14 In May 2013, the Delta Stewardship Council adopted the Delta Plan. The Delta Plan was developed to guide State and local agencies to help achieve the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. To support the implementation of the Delta Plan, the following flood-related actions should be taken: 6.14.1 The Legislature should establish a Delta Flood Risk Management Assessment District with fee authority (including over State infrastructure). 6.14.2 The Legislature should fund the State to evaluate and implement a bypass	Legislation implemented; TM evaluating floodway and bypasses and set-back levee alternatives;	Multiple	Unfunded	X

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
and floodway on the San Joaquin River near Paradise Cut.				
6.14.3 The State should evaluate whether additional areas both within and upstream of the Delta should be designated as floodways and should include the consideration of the anticipated effects of climate change in these areas.				
6.14.4 The State should develop criteria to define locations for future setback levees in the Delta and Delta watershed.				
6.14.5 The Legislature should require adequate levels of flood insurance for residences, businesses, and industries in flood-prone areas.				
6.14.6 The Legislature should consider statutory and/or constitutional changes that would address the State's potential flood liability.				
6.14.7 The U.S. Army Corps of Engineers (USACE) should consider a variance that exempts Delta levees from the USACE's levee vegetation policy.				
6.14.8 State and local agencies and regulated utilities that own and/or operate infrastructure in the Delta should prepare coordinated emergency response plans to protect the infrastructure from long-term outages resulting from failures of the Delta levees. The emergency procedures should consider methods that also would protect Delta land use and ecosystem.				

Table 8-7 Related Actions and Performance Measures for Objective 7 (Manage the Delta to Achieve the Coequal Goals for California)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
7.1 State or local public agencies undertaking covered actions must file certifications of consistency with the Delta Stewardship Council. Certifications of Consistency must include detailed findings that demonstrate how the covered action is consistent with all the policies of the Delta Plan.	The number of covered actions filed with the Delta Stewardship Council	State and local agencies	unfunded	
7.2 Provide a more reliable water supply for California by implementing the following:				
7.2.1 All water suppliers should fully implement applicable water efficiency and water management laws, including urban water management plans; the 20 percent reduction in statewide urban per capita water usage by 2020; agricultural water management plans; and other applicable water laws, regulations, or rules.	A. Identify number of urban and agricultural water suppliers that certify that they have adopted and are implementing supply planning, conservation, and efficiency measures required by State law by 2015, meeting the standards and deadlines established by code.	Local agencies	Unfunded (all)	
7.2.2 DWR, in consultation with the Delta Stewardship Council, the SWRCB, and others, should develop and approve guidelines for the preparation of a water supply reliability element as part of the update of an urban water management plan, agricultural water management plan, integrated water management plan, or other plan that provides equivalent information about the supplier's planned investments in water conservation and water supply development. The expanded water supply reliability element should include the details recommended in the Delta Plan. Water suppliers that receive water from the Delta watershed should include an expanded water supply reliability element in their water management plans, starting in 2015.	B. DWR has developed and published guidelines for the preparation of an expanded Water Supply Reliability Element.	DWR DWR, SWRCB		
7.2.3 DWR and SWRCB should establish an advisory group with other state agencies and stakeholders to identify and implement measures to reduce impediments to achievement of statewide water conservation, recycled water, and stormwater goals. This group should evaluate and recommend updated goals for additional water efficiency and water resource development.	C. DWR and SWRCB have established an advisory group and identified impediments to achievement of statewide water conservation, recycled water and stormwater goals and have evaluated and recommended update goals, including an assessment of how regions are achieving their proportional share of these goals	DWR, DPH, SWRCB, others DWR		
7.2.4 DWR, the SWRCB, the CDPH, and other agencies, in consultation with the Delta Stewardship Council, should revise State grant and loan ranking criteria to be consistent with Water Code section 85021 and to provide a priority for water suppliers that includes an	D. State grant and loan ranking criteria have been revised E. BDCP is completed and DWR and the Bureau of Reclamation have received required take permits	DWR		

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
expanded water supply reliability element in their adopted urban water management plans, agricultural water management plans, and/or IRWM plans.	F. DWR has completed the development and initiated implementation of an integrated statewide system for water use reporting in coordination with other state agencies.	DWR		
7.2.5 DWR and the USBR will complete the Bay Delta Conservation Plan (both the Habitat Conservation Plan/Natural Communities Conservation Plan and the Environmental Impact Report/Environmental Impact Statement), a 50-year ecosystem-based plan designed to restore fish and wildlife species in the Delta in a way that protects California's water supplies while minimizing impacts on Delta communities and farms. Upon adoption of the BDCP and receiving the necessary permits by the regulating agencies, DWR and the USBR will implement the 22 proposed conservation measures in the BDCP to help wildlife and reverse the decline of native fish populations in the Delta.	G. DWR has modified the California Water Plan update to include specified categories of information to be tracked.	DWR		
7.2.6 DWR, in coordination with the SWRCB, CDPH, Public Utilities Commission, Energy Commission, USBR, California Urban Water Conservation Council, and other stakeholders, should develop a coordinated statewide system for water use reporting. Water suppliers that export water from, transfer water through, or use water in the Delta watershed should be full participants in the database.	H. Funds are available in the IRWMP and LGAP programs for surface water improvement and GW data management			
7.2.7 DWR, in consultation with the SWRCB, and other agencies and stakeholders, should evaluate and include in the next and all future CWP updates information needed to track water supply reliability performance measures identified in the Delta Plan, including an assessment of water efficiency and new water supply development, regional water balances, improvements in regional self-reliance, reduced regional reliance on the Delta, and reliability of Delta exports, and an overall assessment of progress in achieving the coequal goals.				
7.2.8 Immediately provide financial incentives and technical assistance through the IRWM plans and the Local Groundwater Assistance Program to improve surface water and groundwater monitoring and data management.				
7.3 Water quality in the Delta should be maintained at a level that supports, enhances, and protects beneficial uses identified in the applicable SWRCB and RWQCB water quality control plans.			Unfunded (all)	
7.3.1 The SWRCB should update the Bay-Delta Water Quality Control Plan				

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
objectives as follows: A. By June 2, 2014, adopt and begin to implement updated flow objectives for the Delta that are necessary to achieve the coequal goals. B. By June 2, 2018, adopt, and as soon as reasonably possible, implement flow objectives for high-priority tributaries in the Delta watershed that are necessary to achieve the coequal goals.		SWRCB		
7.3.2 The SWRCB and RWQCBs should work collaboratively with DWR, DFW, and other agencies and entities that monitor water quality in the Delta to develop and implement a Delta Regional Monitoring Program that will be responsible for coordinating monitoring efforts so Delta conditions can be efficiently assessed and reported on a regular basis.	A. The SWRCB adopts Delta flow objectives by June 2, 2014.	SWRCB		
	B. The SWRCB adopts flow objectives for the major tributaries in the Delta watershed by June 2, 2018	SWRCB, RWQCB		
7.3.3 DFW and other appropriate agencies should prioritize and implement actions for non-native invasive species from the *Conservation Strategy for Restoration of the Sacramento–San Joaquin Delta Ecological Management Zone and the Sacramento and San Joaquin Valley Regions* (California Department of Fish and Game 2011).	C. A Delta regional water quality monitoring program is developed.	DFW		
	D. The Department of Fish and Wildlife and other appropriate agencies prioritize the list of "State 2 Actions for Nonnative Invasive Species."			

Table 8-8 Related Actions and Performance Measures for Objective 8 (Prepare Prevention, Response, and Recovery Plans)

Related Actions	Performance Measures	Responsible / Lead Entity	Funding Status (Full, Partial, or Unfunded)	Legislation Required (X for Yes)
8.1 Communities in floodplains should consider the consequences of flooding and should develop, adopt, practice, and regularly evaluate formal flood emergency preparedness, response, evacuation, and recovery plans (see Objective 6). A. State government should assist disadvantaged communities located in floodplains to prepare for and recover from flood emergencies.		Local government & State government		
8.2 Water shortage contingency plans prepared as part of the 2015 urban water management plans should increase drought planning from a 3-year drought to a 4-year drought, until more accurate information is available.				
8.3 By December 2014, DWR will update the California Drought Contingency Plan which includes: A. Articulation of a coordinated strategy for preparing for, responding to, and recovery from drought. B. Assessment of state drought contingency planning and preparedness. C. Description of State government's role and responsibilities for drought preparedness. D. Identification of needed improvements for drought monitoring and preparedness. E. Identification of measures to mitigate the economic, environmental, and social risks and consequences of drought events. F. Assessment of and adaptation to the impacts of drought under existing and future conditions, including climate change. G. Identification of needed improvements to real-time surface water and groundwater monitoring programs. H. Identification of needed research in drought forecasting. I. Identification of needed research of the indices and metrics for assessing the levels of drought.				

Related Actions	Performance Measures	Responsible / Lead Entity	Funding Status (Full, Partial, or Unfunded)	Legislation Required (X for Yes)
8.4 DWR will work with the California Governor's Office of Emergency Services (Cal OES) to develop preparedness plans to respond to other catastrophic events, such as earthquakes, wildfires, chemical spills, facility malfunctions, and intentional disruption, which would disrupt water resources and infrastructure.				
8.5 Cal OES, the California Governor's Office of Planning and Research (OPR), and the California Natural Resources Agency should lead an effort to update the State Emergency Plan and State Multi-Hazard Mitigation Plan to strengthen consideration of climate impacts to hazard assessment planning, implementation priorities, and emergency responses.	A. Update the State Emergency Plan by 2015. B. Update the State Mulit-Hazard Mitigation Plan by 2014	Cal OES		
8.6 Cal OES, DWR, and the Delta counties should work together to develop a catastrophic flood response plan for the Delta region. This plan should support an integrated response within the Delta and increase communication efforts between stakeholders and federal, State, tribal, local, and private agencies.	Complete first phase of the Northern California Flood Response Plan by 2014.	Cal OES & DWR		
8.7 Cal OES will work with appropriate agencies to update the San Francisco Bay Area Catastrophic Earthquake Response Plan and incorporate lessons learned from the 2013 Golden Guardian exercise.	Complete San Francisco Bay Area Catastrophic Earthquake Response Plan by 2013	Cal OES & FEMA		

Table 8-9 Related Actions and Performance Measures for Objective 9 (Reduce the Carbon Footprint of Water Systems and Water Uses)

[table to come]

[These related actions are under development and will include actions and recommendations from the updated WETCAT strategy, when available.]

Table 8-10 Related Actions and Performance Measures for Objective 10 (Improve Data, Analysis, and Decision-Support Tools)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
To develop and use analytical tools more effectively, DWR should take the following actions, in coordination with the SWRCB, CDPH, Public Utilities Commission, Energy Commission, USBR, California Urban Water Conservation Council, California Council for Science and Technology, IRWM Regional Water Management Groups, and other agencies, organizations, tribes, and stakeholders.				
10.1 Expand the Central Valley Planning Area scale analytical tool and scenario studies developed during Update 2013 to assess future vulnerabilities and management responses in the other hydrologic regions for the California Water Plan Update 2018. The regional analytical tools and analysis should include evaluation of water supply reliability, water efficiency and new water supply development, regional water balances, improvements in regional self-reliance, reduced regional reliance on the Delta, and reliability of Delta exports. Over time, these tools should be enhanced to include water quality, economic, and biological metrics, as well as to evaluate a greater number of the resource management strategies in Volume 3.	A. Develop project charter. B. Number of DWR Planning Areas represented within the future scenario analysis. C. Number of resource management strategies represented within the future scenario analysis.	DWR	Partially Funded	
10.2 Develop a shared conceptual understanding, analytical framework, and quantitative description of how California watersheds and water management systems are represented in analytical tools at different spatial and temporal scales for use by federal, State, tribal, regional, and local agencies and organizations.	A. Develop project charter. B. Inventory of watershed hydrologic features and water management strategies that are represented within analytical tools.	DWR or research collaborative	Unfunded	
10.3 Support the California Water and Environmental Modeling Forum (CWEMF) in updating its 2000 modeling protocols and standards to provide more current guidance to water stakeholders and decision-makers, and their technical staff as models are developed and used to solve California's water and environmental problems.	Develop project charter.	CWEMF	Unfunded	
To improve water data and information, DWR should take the following actions, in coordination with the SWRCB, CDPH, Public Utilities Commission, Energy Commission, USBR, California Urban Water Conservation Council, California Council for Science and Technology, IRWM Regional Water Management Groups, and other agencies, organizations, tribes, and stakeholders.				
10.4 Establish standards and protocols for data collection and management that facilitate sharing of information among agencies and modeling studies. This would include identifying and cataloging existing water data for California, creating a water data dictionary, and developing standards and metadata for	A. Develop project charter. B. Inventory of existing water data for California. C. Developed water data	DWR or research collaborative	Unfunded	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
water data monitoring, collection, and reporting.	dictionary. D. Develop standards and metadata for water data monitoring, collecting, and reporting.			
10.5 Develop a strategic plan for data management that prioritizes long-term improvements in the monitoring network considering risk-based decision-making, and that identifies adequate resources for long-term maintenance and accessibility to water management information.	A. Develop project charter. B. Criteria for prioritizing term improvements in the monitoring network.	DWR or research collaborative	Unfunded	
10.6 Improve drought planning and preparation by: 10.6.1 Developing drought metrics (indicators) with the goal of providing early detection and determination of drought severity. 10.6.2 Developing and improving monitoring of key indicators of regional water vulnerabilities. 10.6.3 Improving the system of stream gauging for the purpose of managing water resources in low-flow conditions and improving the accuracy of seasonal runoff and water supply forecasts. 10.6.4 Improving groundwater monitoring and assessment by providing technical and financial support to develop real-time monitoring of groundwater data. 10.6.5 Expanding the existing surface water and groundwater monitoring networks, where needed.	A. Develop project charter. B. Percent completion of items 10.6.1 to 10.6.5.	DWR	Partially Funded	
10.7 Develop a strategy and implementation plan for measuring and reporting water use and water quality data. The accurate measurement, timely publication, and broad distribution of water use and water quality will facilitate better water planning and management, especially in the context of managing aquifers more sustainably, and are necessary for the development of more accurate hydrologic budgets.	A. Develop project charter. B. Inventory of existing water data for California.	DWR or research collaborative	Unfunded	
10.8 Sponsor science-based, watershed adaptation research and pilot projects to address water management and ecosystem needs, improve aquatic species and habitat monitoring, and develop an accessible and standardized database for reporting watershed and headwater conditions.	A. Develop project charter. B. Develop criteria for selecting research and pilot projects.	DFW	Unfunded	
To improve data and information exchange, DWR should take the following actions, in coordination with the SWRCB, CDPH, Public Utilities Commission, Energy Commission, USBR, California Urban Water Conservation Council, California Council for Science and Technology, IRWM Regional Water Management Groups, and other agencies, organizations, tribes, and stakeholders.				

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
10.9 Develop the Water Planning Information Exchange (Water PIE) to facilitate sharing data and networking existing databases among federal, State, tribal, regional, and local agencies and governments, nonprofit organizations, and citizen monitoring efforts. The Water PIE data framework will help improve analytical capabilities and develop timely surveys of statewide land use, water use, and estimates of future implementation of resource management strategies. Potential beneficiaries of Water PIE include urban water management plans, agricultural water management plans, groundwater management plans, IRWM plans and the CWP.	A. Develop project charter. B. Develop business requirements for Water PIE. C. Complete Pilot Project for Water PIE. D. Inventory of existing water data for California.	DWR	Partially Funded	
10.10 Support establishment of an open, organized, and documented quantitative representation of the State's intertied water system to serve as a common and standardized data platform for model development and analysis by federal, State, tribal, regional, and local water planners.	A. Develop project charter. B. Inventory of existing analytical tools and water data for California.	DWR or research collaborative	Partially Funded	
10.11 Implement Shared Vision Planning or similar collaborative modeling approaches to integrate tried-and-true planning principles, systems modeling, and collaboration into a practical forum for making more informed and durable water resources management decisions.	A. Develop project charter. B. Develop facilitation plan.	DWR	Partially Funded	

Table 8-11 Related Actions and Performance Measures for Objective 11 (Invest in Water Technology and Science)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
11.1 Advance new water technology to improve Data Management and Modeling by implementing the following: 11.1.1 Development and implementation of a standardized protocol for water use and quality measurement and reporting strategy and implementation plan necessary for sustainable California water planning and management. 11.1.2 Development and compliance of protocol for distributed data storage and use policy with all database managers and with all data linked to the appropriate metadata. 11.1.3 Development of effective interactive database portals, such as Water PIE (DWR) and HOBBES (UC Davis), should continue with a high priority. 11.1.4 Support for the maintenance of current modeling protocols and standards that provide guidance to water stakeholders and decision-makers, and their technical staff, as models are developed and used to solve California's water and environmental problems. The California Water and Modeling Forum should continue to have a major role in this important effort.	A. Status of development and implementation stategry. B. Status of development and compliance with protocol. C. Status of development of database portal. D. Degree of support for monitoring of model protocols.	Resources Agency & CalEPA , Health and Human Services, Public Utilities Commission, Energy Commission, Bureau of Reclamation, USEPA and other stakeholders.	All partially funded, except 11.1.2 is unfunded	Yes, for all sub-actions
11.2 Advance new water technology to improve both in situ (on-site) and remote sensing for data acquisition by implementing the following: 11.2.1 Developing closer coordination between in situ sensing and remote sensing. 11.2.2 Supporting technology fairs and/or other effective venues for presenting licensing opportunities for technology developed by the National Laboratories and other government agencies with technology development focused on the water environment. 11.2.3 Increasing the deployment of land based radar where local topographic features prevent adequate weather forecasting. *In situ (on-site) Data Acquisition:* Priorities for in situ data acquisition technology research include: 11.2.4 Development is required of protocol for data acquisition and compatibility of associated equipment.	A. Availability of translation software. B. Numbers of technology fairs held.Means of effectively transfer technology that does not orphan important technology is in use. C. Number of landbased radar systems deployed. D. Status of development of protocol. E. Status of development of sensors. F. Development of remote sensing capability for freshwater	Resources Agency, CalEPA, DWR, Governor's Office (GoBiz), NOAA, NASA, DOE Labs & University Research	All unfunded, except 11.2.8 & 11.2.9 are partially funded.	Yes, for 11.2.4

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
11.2.5 Development of cost effective sensors. *Remote Sensing Data Acquisition:* Priorities for remote sensing data acquisition technology research include: 11.2.6 Development and use of remote sensors capable of accurately determining qualitatively quantitatively more chemical and physical parameters for fresh water bodies. 11.2.7 Development of inexpensive, local remote sensors to replace or complement *in situ* sensors for the purpose of providing monitoring capability that is less susceptible to vandalism. 11.2.8 Continue the development of utilizing airborne drones to provide targeted data to complement satellite data (e.g., snowpack, reservoir level). 11.2.9 Increased partnerships between the National Aeronautics and Space Administration (NASA), state and private sectors to enhance existing resources while realizing savings by reducing duplicative monitoring and/or increasing required data acquisition opportunities.	chemical and physical parameters. G. Number of inexpensive local remote sensors in use. H. Number of drones routinely used. I. Number of public/private partnerships.			
11.3 Advance new water technology to improve efficiencies for the Water-Energy Nexus by implementing the following: 11.3.1 Smart grid technologies for water and energy conservation and management. 11.3.2 Use of renewable energy for water treatment and transport processes. 11.3.3 Developing anaerobic processes to facilitate energy recovery from supply and wastewater organic residuals. 11.3.4 Improve technology for residential use of point-of-use (POU) and point-of-entry (POE) treatment.	A. Percentage of connections with automatic and advanced metering technology installed. B. Percent of energy for water uses from renewable sources in 2020. C. Percent of organic residual treatment processes providing bioenergy in 10 years. D. Level of self monitoring incorporated into POU and POE devices	DWR, PUC, CEC, SWRCB, CDPH	All Unfunded	Yes, for 11.3.1, 11.3.2 & 11.3.3
11.4 Advance new water technology to improve Membrane Water Treatment by implementing the following: 11.4.1 Further development of more robust, cost- and energy- efficient, general-purpose membranes for use in seawater desalination, brackish water treatment, and wastewater and water reuse applications, with removal of contaminants not now efficiently removed (e.g., boron, contaminants of emerging concern), and	A. Number of cost effective low energy use membranes developed and in use. B. Number of l high pressure RO applications fitted with energy recovery devices C. Level of advancement of	DWR, SWRCB, CEC, CDPH	All partially funded, except 11.4.5 is unfunded.	Yes, for 11.4.5

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
recovery of beneficial salts and minerals for reuse. 11.4.2 Further development of energy recovery technologies, particularly for high-pressure reverse osmosis units (e.g., operational pressure as high as 1,180 pounds per square inch gauge [psig], or 8 megapascals [MPa]) but also with application to separation technologies operating at lower pressures. 11.4.3 Further development of smart control technology that ensures more dependable operation of treatment facilities including remotely located treatment facilities (distributed treatment). 11.4.4 Development of membrane separation technologies capable of reliable and economic deployment to remotely located communities (distributed treatment). 11.4.5 Significantly broadened deployment of brine disposal technologies for disposal into marine environments already used outside of California.	remotely controlled small water treatment units D. Level of advancement of membrane separation technology in remote communities. E. Level of deployment of brine disposal technologies.			
11.5 Advance new water technology to improve Biological Water Treatment by implementing the following: 11.5.1 Development and deployment of technologies focused on wastewater cleanup for recycling process and wastewater, including use as drinking water (i.e., drinking water, irrigation, process water, groundwater recharge). 11.5.2 Development of technologies to reduce chemical use and increase energy efficiency, such as engineered wetlands for wastewater treatment and ecosystem enhancement. 11.5.3 Technology development to support the increased use of affordable distributed biological water and wastewater treatment systems for small, rural communities. 11.5.4 Development of better control technology for biological treatment, similar to the earlier stated research priority for membrane separation technology.	A. Number of wastewater cleanup technologies developed and deployed. B. Number of new innovative sites using engineered wetlands and meadows for wastewater treatment. C. Number of biological based water and wastewater treatment units deployed in small communities. D. Number of small water treatment units being operated remotely using smart control technology.	SWRCB, CDPH, DWR	All unfunded, except 11.5.4 is partially funded.	
11.6 Advance new water technology to improve watershed management by implementing the following: 11.6.1 Software development that leads to more effective combining and utilizing of applicable models, in recognition of the need for the effective management of the multiple factors affecting	A. Status of development of modeling software and major models. B. Status of improved surface and groundwater data collection.	DWR, SWRCB, Resources Agency, CalEPA &	All unfunded, except 11.6.2 is partially	Yes, for 11.6.3

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
watersheds, including climate change impacts. 11.6.2 Improved data collection for surface-water and groundwater basin descriptive parameters, including water runoff and storage as a function of time throughout the basin by more extensive use of satellite monitoring, where applicable, and partnering with other agencies (i.e., DWR, SWRCB, US Geological Survey, and others) where possible. 11.6.3 Expanded use of flood plains and other sites having good recharge potential for groundwater recharge.	C. Number of groundwater recharge sites developed and implemented.	Applicable Federal Agencies	funded.	
11.7 Advance new water technology to improve Agricultural Water Use Efficiency by implementing the following: 11.7.1 Increase the adoption of field level water measurement (flow and total) and soil moisture-sensing technologies to increase water management accuracy and data. 11.7.2 Promote the use of high-efficiency water irrigation systems, provide necessary maintenance, and utilize proper irrigation scheduling methods to optimize water- and energy-use efficiency. 11.7.3 Increased adoption of one or more technologies for irrigation scheduling (e.g., including remote sensing, weather based, and/or crop/soil-based technologies). 11.7.4 Development of cost-effective irrigation system performance information monitoring platforms for evaluating irrigation performance criteria in real time. 11.7.5 Increase the number of water districts that provide water deliveries on a demand basis to maximize on-farm water use efficiency. 11.7.6 Use agricultural water and land whenever appropriate to provide local environmental benefits (e.g., flooded rice ground to provide seasonal wetlands for migratory birds and reproduction habitat for fish and aquatic life). 11.7.7 Identification of shared use opportunities for water supplies (e.g., water exchanges between agricultural and urban users).	A. The level of adoption of cost effective water measurement and soil moisture sensing technology. B. The percentage of high efficiency irrigation systems in use. C. The level of adoption of advanced technologies for irrigation scheduling D. The level of development of irrigation performance monitoring platforms. E. The percentage of water districts that supply water based on customer demand. F. The number of acres or volume of water that provides a local environmental co benefit. G. The number of transfers or the volume of water transferred between water suppliers or water users. H. Identification and testing of performance monitoring	DWR, CDFA	All unfunded	Yes, for 11.7.1 and 11.7.7

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	platforms			
11.8 Advance new water technology to improve Urban Water Use Efficiency by implementing the following: 11.8.1 Metering infrastructure to promote more efficient water use (e.g., individual apartments, remote access to water use data). 11.8.2 Continued advancement of plumbing code and efficiency standards for low-flow appliances and fixtures, such as toilets and clothes and dish washers in the home and low-flow cleaning technologies in the commercial and industrial sectors. 11.8.3 Increased use of American Water Works Association water-loss software and verification program. 11.8.4 Greater use of low-water-use landscaping.	A. Percentage of water connections using advanced metering and submetering technology B. Level of implementation of efficient plumbing code and appliance water standards C. The percentage of water districts implementing water loss analysis and repair programs. D. Percentage of low water use landscapes.	DWR, PUC, CEC, SWRCB, CDPH, CDFA	All unfunded, except 11.8.2 is partially funded.	Yes, for 11.8.1 & 11.8.4

Table 8-12 Related Actions and Performance Measures for Objective 12 (Improve Tribal/State Relations and Natural Resources Management)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
12.1 The State, in collaboration with California Native American Tribes, should, where it is within the State's authority, address tribal water rights, including tribal water rights dating back to time immemorial; federally reserved water rights; jurisdiction; and trust responsibilities, including individual allotments, by: 12.1.1 Convening a task force to articulate a consistent State policy and protocol that recognizes tribal water rights in all aspects of water planning, including supply, timing, flows, quality, and quantity. 12.1.2 Bureau of Indian Affairs and SWRCB, in collaboration with California Native American Tribes, developing joint training on State, federal, and tribal water rights, including trust responsibilities, the implications for different tribal trust lands (reservations, Rancherias, and individual allotments) and jurisdiction.	A. Convene a task force. B. Develop and provide initial training class.	Tribes, Bureau of Indian Affairs, SWRCB		
12.2 State government should write legislation and contracts in a way that enables California Native American Tribes to be a lead agency and directly receive and manage state funding (as fiscal agent or otherwise) for water planning and management.	A. Development of appropriate language by tribes. B. Language incorporated into future water bonds. C. Language incorporated into groundwater basin plans.	Tribes, State Agencies (DWR, CDPH, HHS, SWRCB) responsible for capacity development		X
12.3 DFW and California Native American Tribes will develop and initiate pilot projects to develop resource management plans, characterized by the integration of Traditional/Tribal Ecological Knowledge and western science. This will include identifying existing examples of partnerships and launching pilot projects.	Development and initiation of pilot project(s).	Tribes, DFW		
12.4 State agencies should use Tribal Ecological Knowledge to inform their work and decisions, including establishing baseline resource conditions and developing options to share information in ways that protect specific details about cultural resources.	A. State agencies begin working with tribes to develop a strategy to integrate TEK. B. Number of State agencies that	State Agencies (DWR, SWRCB, DFW, DOC,		

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	consider TEK in their decision-making process. C. Number of adopted State agency strategies and policies that include TEK.	Parks & Recreation)		
12.5 State agencies, in collaboration with California Native American Tribes, should develop and conduct trainings for agencies on tribal sovereignty, trust responsibilities, cultural awareness/sensitivity, and Traditional/Tribal Ecological Knowledge by developing a curriculum with a tribal working group, establishing consistent training protocols for all agencies, and initiating trainings.	A. Identify responsible tribes and State agencies to assist in curriculum development. B. Develop curriculum and consistent training protocols. C. Convene pilot training.	Tribes, State Agencies (Parks & Recreation, SWRCB, DWR, DFW, DOC, etc.)		
12.6 State and federal agencies, in coordination with California Native American Tribes, should identify, coordinate, and provide technical training for California Native American Tribes, to increase technical capacity — including, but not limited to, basic training modules (e.g., Basic Inspector Academy, GIS, small water systems operations, such advanced technologies as LiDAR and satellite imagery) — and establish criteria and protocols for ensuring training vendors preferred by California Native American Tribes are utilized.	A. Level of coordination between State and federal agencies and tribes. B. Identify the type of technical training needed. C. Convene pilot training. D. Development of criteria and process to identify list of Tribal preferred vendors.	Tribes, State agencies, Federal agencies (USGS)	Unfunded	
12.7 State agencies should engage tribal communities in compiling and developing climate change adaptation and resilience strategies that will mitigate climate impacts to their people, waterways, cultural resources, or lands.	A. Level of engagement between State agencies and tribes. B. Number of tribes providing climate change data to the State. C. Development of adaptation and mitigation strategies for Tribal lands.	Tribes, State agencies	Partially Funded	
12.8 The SWRCB should, in collaboration with California Native American Tribes, propose a statewide beneficial use definition that respects and acknowledges cultural and subsistence use of water and this definition should be adopted in	Development and adoption of new beneficial use definition that respects and acknowledges cultural and	SWRCB, Tribal Workgroup		

Related Actions		Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	statewide water quality control plans.	subsistence use of water.			
12.9	State agencies and California Native American Tribes should utilize and implement communication strategies, protocols, and procedures that are developed and/or implemented by California Native American Tribes, including but not limited to the Tribal Communication Plan, U.N. Declaration on the Rights of Indigenous Peoples, 2013 Tribal Water Summit Guiding Principles and Goals, and tribal memoranda of understanding.	Number of state agencies that develop tribal communication plans.	Tribes, State agencies		
12.10	State agencies, in collaboration with California Native American Tribes, should enhance tribal outreach, communication, coordination, collaboration and the work of tribal liaisons by identifying and implementing strategies to strengthen tribal involvement in State outreach and engagement approaches; clarify tribal liaison roles and responsibilities; and identify options for creating a statewide network of tribal liaisons to address multiple aspects of tribal concerns (e.g., legal, policy, and local conditions).	Number of statewide tribal liaisons created.	Tribes, Governor's Office of the Tribal Advisor		
12.11	State agencies should engage in meaningful consultation by encouraging and moving toward earlier involvement by California Native American Tribes (at the design/planning stages); initiating consultation for programmatic decisions as well as project-level decisions; understanding individual California Native American Tribes' protocol for consultation, adjusting timelines to allow adequate time to bring items before tribal councils and leaders; conducting meetings on tribal lands; and documenting tribal comments.	Development and implementation of consultation policy by State agencies.	Tribes, State agencies		

Table 8-13 Related Actions and Performance Measures for Objective 13 (Ensure Equitable Distribution of Benefits)

Related Actions	Performance Measures	Responsible / Lead Entity	Funding Status (Full, Partial, or Unfunded)	Legislation Required (X for Yes)
13.1 Ensure implementation of the policy goals of California Water Code Section 106.3, (AB 685) which state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.				
13.1.1 State government should ensure that the goals established by the policy — safe, clean, affordable, and accessible water adequate for domestic uses — are reflected in agency planning.				
13.1.2 State government should give preference to policies that advance the policy and refrain from taking actions that adversely affect the human right to water.				
13.1.3 State government should report on actions undertaken to promote the policy and make information relevant to the human right to water available to the public.				
13.1.4 State government should foster meaningful opportunities for public participation in agency decision-making by California's diverse population.				
13.1.5 State government should facilitate access by rural and urban DACs to state funds for water infrastructure improvements.				
13.1.6 State government should ensure the effectiveness of accountability mechanisms protecting access to clean and affordable water.				
13.2 Develop CWP goals and objectives, in coordination with IRWM partnerships, to resolve water-related public health issues in DACs.				
13.2.1 California tribes, both recognized and unrecognized, should provide goals and objectives to protect tribal uses of water, especially those that affect the health of tribal members (see Objective 12).				

Related Actions	Performance Measures	Responsible / Lead Entity	Funding Status (Full, Partial, or Unfunded)	Legislation Required (X for Yes)
13.2.2 DWR, DFW, and other State agencies should develop statewide goals and objectives for the provision of safe fish for communities that rely on fish as part of their subsistence diet.				
13.2.3 DWR, in consultation with other State agencies, including the Department of Conservation, tribes, and community groups, should develop goals and objectives to restore and protect watersheds by making use of existing community-based watershed councils and groups under-utilized in maintaining and restoring California's water resources.				
13.3 Support financial mechanisms to facilitate improved wastewater removal systems.				
13.3.1 The SWRCB and DWR should establish incentives to support conversion to municipal or other upgraded wastewater removal systems.				
13.3.2 The SWRCB and DWR should establish a process to create introductory, then graduated, wastewater rates to allow a period of adjustment for new fees.				
13.4 Increase disadvantaged community access to funding.				
13.4.1 The SWRCB, CDPH, DWR and other State agencies should work with DACs and vulnerable populations and their advocates to review State government funding programs and develop guidelines that make funding programs equally accessible to DAC and EJ communities.				
13.4.2 The SWRCB, CDPH, DWR and other State agencies should work with disadvantaged communities and vulnerable populations and their advocates to develop a technical assistance program to provide resources, expertise, and information to disadvantaged and environmental justice communities to enable them to actively and equally participate in planning processes and access funding sources.				

Related Actions	Performance Measures	Responsible / Lead Entity	Funding Status (Full, Partial, or Unfunded)	Legislation Required (X for Yes)
13.5 Provide incentives for the consolidation, acquisition or improved management of small water systems.				
13.5.1 CDPH should establish incentives to encourage consolidation with the "smalls" by the larger system. There are valid concerns on the part of the larger system when approached with the idea of acquiring small, dysfunctional systems.				
13.5.2 CDPH should conduct outreach and education for customers and shareholders to a proposed consolidation to ensure informed decision-making.				
13.5.3 CDPH should support efforts to improve licensing and training options for small water system operators.				
13.6 CDPH should implement its Small Water System Program Plan to assist small water systems (especially those serving DACs) that are unable to provide water that meets primary drinking water standards.				
13.6.1 CDPH should share the Small Water System Program Plan with relevant federal, State, and local agencies, as well as stakeholders, to foster additional opportunities for funding, coordinate construction projects in communities, and assist in local and regional planning efforts.				
13.6.2 CDPH should utilize GIS tools to identify large water systems in close proximity to targeted small water systems, and conduct targeted outreach to these large water systems to encourage them to consolidate the small systems into their service area.				
13.6.3 CDPH should work with stakeholders to identify obstacles to consolidation (including financial, legal and local issues) and develop possible actions to address these obstacles.				
13.6.4 CDPH should participate in statewide planning efforts to address the water infrastructure needs of small water systems. CDPH should seek input from other states and the federal government on innovative,				

Related Actions	Performance Measures	Responsible / Lead Entity	Funding Status (Full, Partial, or Unfunded)	Legislation Required (X for Yes)
successful efforts to address the needs of small water systems, and should share its results on implementation of it Small Water System Program Plan.				
13.7 Collect and maintain data on EJ communities and DACs				
13.7.1 The SWRCB, CDPH, DWR, and other State and federal agencies should coordinate their review of current monitoring and regulatory programs to identify and address gaps in available data and monitoring programs that affect DACs and vulnerable populations.				

Table 8-14 Related Actions and Performance Measures for Objective 14 (Protect and Enhance Public Access to the State's Waterways, Lakes, and Beaches)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
14.1 Respect and Protect. State government will respect and vigorously protect waterways, lakes, and beaches for beneficial public use. 14.1.1 The State will support the regulatory responsibilities of the California Coastal Commission (beach access), Bay Conservation and Development Commission (San Francisco estuary access), SWRCB (water quality and supply), State Lands Commission (navigation), DFW (inland fisheries), and others that protect beneficial uses such as fishing, boating, and other public access rights. 14.1.2 State conservancies — such as the Sacramento-San Joaquin Delta Conservancy, Tahoe Conservancy, and Sierra Nevada Conservancy — should acquire and/or protect sensitive landscapes, such as key watershed lands and wetlands, flood conveyance zones, riparian woodlands, and vernal pools with important natural resource and scenic values, and significant beneficial public uses. The conservancies, including the State Coastal Conservancy, should protect and/or acquire land to maintain public access to waterways, lakes, and beaches. 14.1.3 The State should protect recreational resource values threatened by the effects of climate change by using strategies of reinforcement, adaption, and/or retreat as feasible. 14.1.4 As water resources are developed, flood control facilities are envisioned, and sea level rise is accommodated, State government, including, but not limited to, DWR and the California Department of Transportation, will protect and minimize impacts on cultural and recreational uses.	A. By July 1, 2015, and annually thereafter, State agencies should report on successful efforts to protect beneficial public use, and barriers to fully meeting these responsibilities. B. By July 1, 2015, the State Lands Commission, collaborating with other agencies, should provide an online searchable database of legal public access locations to waterways, lakes and beaches. C. By July 1, 2015, State conservancies should collaborate on land acquisition priorities and climate change adaptation and mitigation strategies.	CCC, BCDC, SWRCB, SLC, CDFW, State Conservancies.	A. ? B. ? C. ?	
14.2 Research and Planning. State government should engage in statewide research and planning to meet California's unmet and growing demand for safe public access to waterways, lakes, and beaches. 14.2.1 State government, such as the California Department of Parks and Recreation (California State Parks) and DWR, should document and regularly report on the water-dependent recreational trends of California's growing population, the public health and economic benefits of recreational activities, and threats to the tourism and lifestyle benefits of California's water-dependent recreational infrastructure. 14.2.2 State government, such as DWR, will report on the feasibility of incorporating public access facilities into each water resources development and flood management infrastructure project, watershed	A. Every 5 years, CSP and DWR should report on statewide water-dependent recreation trends and demand. B. Annually, beginning July 1, 2014, DWR should report on all State agency expenditures to provide the SWP's public benefits, as well as the source of those funds. C. By July 1, 2014, DWR should establish a state, federal and	CSP, DWR, SCC,BCDC	All partially funded, except PM "B" is fully funded, and PM "D" is unfunded.	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
protection efforts, and environmental restoration projects funded by the State and federal governments. Consider multi-benefit projects that increase waterfront accessibility, create more inclusive access opportunities, support commercial and recreational fishing, encourage economic revitalization, promote excellence and innovation in urban design, enhance cultural and historic resources, and are resilient to a changing climate. Plan to include, where feasible, levee crown widening in levee improvement projects to accommodate multi-purpose recreational trails and bike lanes. 14.2.3 State conservancies, such as the State Coastal Conservancy, Bay Conservation and Development Commission, and California State Parks should collaborate with local agencies to systematically plan to reinforce, adapt, and/or relocate recreational opportunities threatened by sea level rise and transportation or wastewater infrastructure adaptations. 14.2.4 California State Parks should lead comprehensive recreation resource planning of the state's inland waterways, engaging the public, recreation providers, policy-makers, advocacy groups, and public officials. Consider facilities that provide opportunities for the top outdoor recreation activities identified in the *Survey of Public Opinions and Attitudes on Outdoor Recreation in California*, especially those benefiting disadvantaged communities.	local agency Proposed Water Project Recreation Coordinating Committee to meet at least quarterly, to provide guidance on incorporating public access facilities in new projects. D. By July 1, 2014, DPC and SSJDC should establish a multi-agency Delta and Suisun Marsh Recreation and Tourism Coordinating Committee to provide guidance on enhancing water-dependent recreation. E. By July 1, 2016, SCC and BCDC should prepare a comprehensive report on SLR threats to existing public access, with potential management actions. F. By July 1, 2016, CSP should prepare a public access plan for navigable inland waterways.			
14.3 Enhance. All State agencies with public access responsibilities should, in concert with local agencies, enhance safe public access by providing water-dependent recreational facilities and programs that support beneficial uses, and/or improve the social and economic sustainability of federally funded and State- funded infrastructure, watershed protection, and environmental restoration projects. 14.3.1 State government, including DWR, California State Parks, and all state conservancies, should facilitate and/or construct water-dependent recreation projects that spur the economic development of disadvantaged communities, provide environmental stewardship benefits, enhance natural resource values, protect or relocate existing recreational opportunities, and meet the regional demand for healthy outdoor recreation opportunities for all Californians, especially children. 14.3.2 The Delta Protection Commission and Sacramento-San Joaquin Delta	A. By July 1, 2016, state agencies should update State grant criteria to fund public access enhancement in watershed protection, flood management and water resources development projects unless demonstrated infeasible. B. By July 1, 2015, DWR will secure adequate, on-going funding to provide SWP public access facilities commensurate with demonstrated demand. C. Annually, beginning July 1,	DWR, CSP, Conservancies	All partially funded, except PM "D" is unfunded.	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
Conservancy should encourage partnerships between other State and local agencies, local landowners, and business people to expand water-dependent recreation and tourism in the Delta and Suisun Marsh, while minimizing adverse impacts on non-recreational landowners. Use California State Parks' *Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun Marsh* and the Delta Protection Commission's *Economic Sustainability Plan* as guides. 14.3.3 As California's population increases, State government, such as DWR, DFW, and California State Parks, should increase water-dependent recreation opportunities on existing public land, where feasible. State government should also pursue acquisition opportunities that provide open space and public access to water features, such as the ocean, lakes, rivers, streams, and creeks, where demand exceeds supply. 14.3.4 State agencies should prioritize construction of water-dependent recreation facilities identified in IRWM plans; active-use facilities, such as multi-use trails for equestrians, hikers, walkers, and bikers, which improve public health; boating trails; facilities that mitigate or adapt to climate change; facilities that increase the safety of anglers, swimmers, and boaters; and facilities that provide environmental education, such as water conservation and water quality information.	2015, CSP should report on the location of all new waterfront public access facilities constructed with State funds. D. By July 1, 2017, state agencies should apply for at least six National Water Trail program designations.			
14.4 Promote. All State agencies with waterfront public access responsibilities should cooperate with local agencies, businesses, and the general public to promote healthy outdoor recreation, resource-based tourism, and environmental stewardship to benefit public health and welfare, improve the environment, and grow the economy commensurate with protection of public property rights. 14.4.1 All state conservancies, DWR, DFW, and California State Parks should improve outreach and education to children and in disadvantaged communities that will improve public health, support California's outdoor lifestyle, and promote wise use of water resources.	A. By July 1, 2015, the SNC should develop and implement a Sierra Nevada Sustainable Tourism and Recreation Strategy to promote sustainable water-dependent recreation. B. By July 1, 2015, California State Parks should convene a state agency task force to develop an education and outreach campaign to promote water-dependent recreation state-wide. The task force should recommend public-private partnership funding mechanisms to implement the campaign.	SNC, CSP, State agencies	All unfunded	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	C. By July 1, 2016, State agencies should implement the education and outreach campaign to promote water-dependent recreation state-wide.			

Table 8-15 Related Actions and Performance Measures for Objective 15 (Strengthen Alignment of Land Use Planning and Integrated Water Management)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
15.1 State Government should provide additional regulatory and financial incentives to developers and local governments to plan and build using compact and sustainable development patterns. 15.1.1 Regulatory incentives include further streamlining of CEQA review for infill projects and further reductions in brownfields liability for innocent purchasers. 15.1.2 Financial incentives include developing criteria for state grant and funding programs that incentivize compact and sustainable development.	A. Inventory state regulatory and financial incentives to develop base data for future assessment of enhanced incentives. B. Number of expanded or new regulatory and financial incentives.	OPR	Partial	
15.2 The OPR should provide guidance and financial incentives for integration of IWM issues in general plan updates and Sustainable Communities Strategy (SCS), including both substantive and planning process guidance.	State issuance of guidance and financial incentives.	OPR	Unfunded	
15.3 Local governments should integrate relevant IWM issues into their general plan updates. IWM issues relevant to land use planning include water supply, water quality, flood risk management, and climate policies (mitigation and adaptation).	Number of General Plan updates with effective integration of IWM issues. "Effective integration" means substantial treatment of IWM issues, either in existing General Plan elements or a new optional Water Element.	Local governments	Partial	
15.4 The Strategic Growth Council should provide guidance and financial incentives for regional planning agency integration of relevant IWM issues into SCSs, transportation blueprint plans, and other regional plans.	State issuance of guidance and financial incentives.	Strategic Growth Council	Partial	
15.5 Regional planning agencies should integrate IWM issues into their SCSs, transportation blueprint plans, and other regional plans.	Percent of (or Number) of regional planning agencies meaningfully integrating IWM issues in their regional plans.	Metropolitan Transportation Organizations (MPOs) and Councils of Government (COGs)	Unfunded	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
15.6 Local governments should ensure that urban water management plans inform and reflect IRWM plan preparation and implementation, to further IWM integration in local land-use planning that promotes compact and sustainable development.	Number of UWMPs reflecting IRWMPs effective integration of local land use planning for compact and sustainable development.	Local Governments	Partial	
15.7 Local governments should implement specific land-use planning and regulatory measures to reduce flood risks, consistent with IWM principles and BMPs for land use planning. 15.7.1 Measures include preservation of existing floodplains, aquifer recharge areas, and alluvial fans; restoration of natural floodplain functions; and design measures to increase post-flood resiliency. See Objective 6, Related Action 6.8 regarding the process for developing land use planning BMPs.	Number of General Plan updates and local flood management regulations with meaningful policies to reduce flood risks, consistent with IWM principles and DWR best practices.	Local Governments	Partial	
15.8 DWR should assist local governments and developers with implementing the *Integrating Water and Land Management: A Suburban Case Study and User-Friendly, Locally Adaptable Tool*, which calculates life-cycle water infrastructure costs for different development patterns.	Number of local governments and developers using the Tool in their planning decisions.	DWR	Partial	
15.9 State government should evaluate the effectiveness of the 2007 flood management legislation in achieving coordination of land use planning, flood planning, and natural resources. State government should recommend changes to existing laws and their implementation to increase their effectiveness as appropriate.	Issuance of report evaluating effectiveness of 2007 flood legislation.	DWR	Unfunded	X
15.10 State government should evaluate the effectiveness of SB 610 and SB 221 in achieving coordination of land use and water supply planning. State government should and recommend changes to existing laws and their implementation to increase their effectiveness in achieving objectives, as appropriate.	Issuance of report evaluating effectiveness of SB 610 and SB 221.	DWR	Unfunded	X
15.11 State government should invest in innovation and technology for assessment of land use, water supply, and flood conditions to further integrate water management and land use. 15.11.1 The State should provide funding, technical information, and BMPs, and publicize accurate and relevant water resources information for use by local governments and developers. The State could serve as an information clearinghouse for regional	Number innovations in technology for land use and integrated water management.	DWR	Partial	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
water supply, water quality, flood management, and climate change vulnerability information that local governments can use in preparing general plans and evaluating development applications.				

Table 8-16 Related Actions and Performance Measures for Objective 16 (Strengthen Alignment of Government Processes and Tools)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
16.1 To advance IWM, federal, State, tribal, and local government agencies should strengthen alignment among their data, plans, programs, policies, and regulations. More specifically, they should: 16.1.1 Collaborate to develop consistent policies for advancing IWM at a regional scale, and use a broad and diverse mix of administrative tools to implement their policies, including technical assistance and data support; financial incentives; and State funding, guidelines, and regulations. 16.1.2 Adopt the "Strengthening Agency Alignment for Natural Resource Conservation" resolution (April 2013) vision, goals and principles, developed with extensive input from 42 federal and State agencies, including multiple Water Plan State Agency Steering Committee members, among others. 16.1.3 Utilize the best practices and tools recommended in the "Strengthening Agency Alignment for Natural Resource Conservation" resolution. 16.1.4 Participate on the Biodiversity Council's Interagency Alignment Team.	A. State agency policy statements for strengthening alignment B. Agency list of administrative tools being used C. Participation on CBC Interagency Alignment Team	Water Plan State Agency Steering Committee	n/a	No
16.2 State government should more effectively coordinate the work of multi-agency collaboratives, and utilize them to align and implement State water policies and promote IWM. This should include developing and maintaining a shared and easily accessible interagency inventory/repository of processes and tools for strengthening government agency alignment. Examples of multi-agency collaborative include, but are not limited to, the Strategic Growth Council, California Biodiversity Council, Delta Stewardship Council, Ocean Protection Council, Water Plan State Agency Steering Committee, Conservancies and Resource Conservation Districts, California Council on Science & Technology, and California Landscape Conservation Cooperative.	A. State government water planning calendar B. Inventory of companion State and federal plans C. Inventory of State water data collection programs and databases D. Inventory of water-related collaboration venues and public processes E. Inventory of water-related State Listserves and electronic newsletters, etc.	California Biodiversity Council's Interagency Alignment Team	n/a	No
16.3 State government agencies should hire, assign, or train staff with collaboration and conflict resolution knowledge, skills, and abilities (KSA), whose primary job is to work with other federal, State, tribal, regional, and	A. Standard collaboration and conflict resolution KSA language for duty statements	Cal-HR	n/a	No

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
local agencies, organizations, and communities to improve interagency communication, cooperation, collaboration, and alignment. 16.3.1 California Department of Human Resources (Cal-HR) should convene an interagency working group to develop standard language describing collaboration and conflict resolution KSAs for use in duty statements where this core competency is a minimum qualification. 16.3.2 State agencies should include this standard KSA language in duty statements for staff and management classifications to promote State agency collaboration and alignment, and they should require incumbents in these classifications to complete facilitation training.	B. Agency hires with standard collaboration and conflict resolution KSAs C. Collaboration and conflict resolution training class curricula D. Number of Training class participants			
16.4 Federal and State government agencies should use a more inclusive, collaborative, and outcome-based approach for setting consistent and aligned water policies and regulations that are regionally appropriate. More specifically, they should: 16.4.1 Recognize regional and local diversity by assisting, enabling, and empowering regional water collaboratives, such as IRWM Regional Water Management Groups and Resource Conservation Districts, to determine *how* State water policies are implemented in their planning regions and/or watersheds. 16.4.2 Focus on intended and regionally appropriate outcomes (goals and objectives) when setting water policies, regulations, guidelines, and resource management plans for California. Agencies should establish performance measures/indicators to evaluate progress toward achieving desired outcomes, and include an adaptive management approach as a part of regulatory compliance. 16.4.3 Provide a voluntary program for regional collaboratives, such as IRWM Regional Water Management Groups and Resource Conservation Districts, to develop an implementation and monitoring plan that describes the resource management strategies (actions) the group will implement to achieve the regulations' intended outcomes in their planning regions and/or watersheds, as appropriate for their local conditions and resources. 16.4.4 Utilize voluntary, outcome-based and system-scale (watershed and ecosystem) approaches for regulatory and permitting processes, and engage project proponents collaboratively, earlier and more	A. Examples of outcome-based regulations B. Examples of performance measures/ indicators C. Examples of regional implementation plans D. Regional technical assistance survey results E. Project permit process duration	Water Plan State Agency Steering Committee	Partial – additional funding and staff may be needed to work with more regional collaboratives earlier and more often during the regulatory and/or permitting process	No

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
often during the process. 16.4.5 DWR and other State agencies should survey regional collaboratives, such as IRWM Regional Water Management Groups, to determine what technical assistance they need to facilitate collaboration and support change in regulatory approaches.				
16.5 The State should convene regulatory working groups, in collaboration with federal, tribal, and local governments, to improve and streamline regulatory review and permitting processes for implementing IWM projects more expeditiously. These regulatory working groups should take the following actions in collaboration with regional stakeholders, while recognizing the unique differences among California's geographical regions: 16.5.1 Identify critical resource needs of regulatory agencies necessary to adequately implement regulatory programs and proposed regulatory alignment actions to support IWM, including science, tools, data, policy, guidance, and agency personnel. 16.5.2 Maximize the use of existing mechanisms such as habitat conservation plans and natural community conservation plans. 16.5.3 Review and streamline permit processes to improve efficiency and reduce costs, delays, inconsistencies, and associated adverse impacts, and develop regional permitting processes for recurrent actions and operation and maintenance activities. 16.5.4 Develop and adopt region-specific guidance on ecosystem restoration, water quality improvement, and environmental stewardship strategies to expedite review. 16.5.5 Develop and adopt specific guidance to expedite emergency response and public safety projects for high-risk areas. 16.5.6 Evaluate and adjust regulatory staff assignments to improve regulatory review and permitting processes at a regional scale, facilitate earlier staff involvement in planning phases for complex projects, and identify resource gaps. 16.5.7 Compile, maintain, and utilize regional knowledge bases (data, information, and science), including information on endangered species, sensitive habitat, water quality, and other baseline	A. Number of regions with working groups and number/ types of environmental permitting processes reviewed, number and type of activities approved under the new processes with historical comparison B. Regional and/or statewide guidance for water quality and ecosystem restoration C. Number of regions and list of regulatory agencies engaging in baseline data sharing D. Number of regions and list of agencies adopting a regional mitigation database and mitigation bank E. Regional permitting guidebooks	Options -- Strategic Growth Council, CBC Interagency Alignment Team, or Water Plan State Agency Steering Committee	Partial – some existing resources may be reallocated; new funding would be required for additional regulatory agency staff	No

Related Actions		Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
	information.				
16.5.8	Develop and maintain regional environmental mitigation databases and mitigation banks to address the varying mitigation requirements among multiple regulatory programs and agencies in each region and across regions.				
16.5.9	Develop a multi-agency permitting guidebook that includes a description of the relevant permits, permit applications, and permitting guidance for common and more routine IWM projects.				

Table 8-17 Related Actions and Performance Measures for Objective 17 (Improve Integrated Water Management Finance Strategy and Investments)

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
17.1 **Regional and local entities should continue investing in IWM activities based on regional and local conditions, goals, priorities, and solutions.** Reliable and effective water finance planning should continue at the regional and local levels in partnership with State government. Locally sponsored initiatives will continue to be a cost-effective approach for planning and implementing IWM innovation and infrastructure (green and grey) to provide multiple benefits to their respective jurisdictions. Regional and local investments should be augmented and amplified with federal and State public funding.	Regional and local expenditures, using: a) investment categories defined in "IWM Activities" section of Chapter 7, and b) data from "Existing Funding (Component 3)" related action. Type and quality of IWM benefits produced, using benefit types defined in "IWM Scope and Outcomes" section of Chapter 7.	Regional Water Management Groups, Cities, Counties, Water and Flood Districts, Resource Conservation Districts	Partial and often unreliable funding	No
17.2 **State government should continue to provide incentives for regional IWM (IRWM) activities that achieve State goals or provide broad public benefits.** This includes assisting regions technically and financially to implement their IRWM plans and/or help achieve State government goals and interests. State government should continue to enhance incentives for regional activities and invest in infrastructure (green and grey) that provides a public benefit *and* would not otherwise be cost effective.	A. State government expenditures for regional and local incentives, using investment categories defined in "IWM Activities" section of Chapter 7. B. Type, location, and quantity of IWM benefits produced, using benefit types defined in "IWM Scope and Outcomes" section of Chapter 7.	DWR, SWRCB, DPH	Full — Funded through about 2018, when existing bonds will be fully allocated	Yes — new bond (also requires voter approval), new general fund appropriations, or other
17.3 **State government should improve and facilitate access to federal and State public revenue sources.** 17.3.1 State government should develop a central online resource catalog to describe different funding programs, potential IWM revenue sources, and a how-to guide explaining how to apply for funding from these programs. 17.3.2 State government should provide guidance and assistance to local	A. Resource catalog developed and deployed? (Y or N) B. Training and assistance program developed and deployed? (Y or N)	DWR, DPH, SWRCB	Partial	No

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
agencies on how to apply for funding that includes technical and financial assistance, as well as training for regions that do not have the capacity or resources to apply for funding or manage grants. 17.3.3 State government should inventory federal funding sources and provide guidance for partnering with, or leveraging, federal funding.				
17.4 **The governor and the Legislature should broaden the ability of (and create guidelines and limitations for) public agencies to partner with private agencies, entities, and organizations for IWM investments.** New policies are required to overcome the following limitations that have restricted their use: 17.4.1 Private financing rates are generally higher due to tax effects. Local bond financing options would typically be tax exempt for the bondholder and therefore have lower interest rates. 17.4.2 The prohibition of their use for State government projects restricts public-private partnerships (P3s) to local projects.	New legislation developed? (Y or N)	DWR	Unfunded	Yes
17.5 **State government should develop a more reliable, predictable, and diverse mix of finance mechanisms and revenue sources to continue to invest in IWM innovation activities and infrastructure (green and grey) that have broad public benefits, including, but not limited to, General Funds and General Obligation bonds.** An important role of State government is to invest in innovation activities having broad public benefits that include improving State water governance, improving water planning and public engagement, investing in infrastructure (green and grey), strengthening government agency alignment, enhancing information technology (data and analytical tools), and advancing the use of water technology and science. These activities should be conducted in collaboration with the ongoing regional and local	A. Magnitude and variability of State funding over time using: i. Historical expenditure methods and (additional) data presented in Update 2013 ii. Investment categories defined in "IWM Activities" section of Chapter 7.	Governor and Legislature	Unfunded	Yes — new bond (also requires voter approval), new general fund appropriations

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
innovation activities. Finance mechanisms used for these IWM innovation activities should: A. Improve cost effectiveness, efficiencies, and accountability. B. Avoid stranded costs and funding discontinuity. C. Leverage funding across State government agencies. D. Increase certainty of desired outcomes. E. Enable prioritization based on shared funding values, defined principles, goals, objectives, and criteria.				
17.6 **State government should reduce planning and implementation time frames and costs associated with IWM activities by clarifying, aligning, and reducing redundancies among State government agencies' policies, incentive programs, and regulations.** 17.6.1 Develop the scope and methodology and prepare a R*eturn on State Government Investment* report card through the CWP update collaborative process (5-year interval) that would track the occurrence of benefits/value derived from State government investments (and leveraged local investments) by using specific criteria and sustainability indicators. 17.6.2 Convene an interagency IWM finance alignment group that includes State planning, resource management, and regulatory agencies to identify and implement finance policies, procedures, and protocols for the enhancement of State government transparency, accountability, flexibility, and cost efficiencies. This effort would recommend ways to reduce duplication and fragmentation among State government agencies' policies, incentive programs, regulations, and budgets.	A. ROI report card developed? (Y or N) B. New methods for leveraging funding more efficiently and effectively developed (Y or N)?	IWM Finance Alignment Group — DWR, SWRCB, CA Dept. of F&W	Unfunded	Yes, to Implement IWM alignment group recommendations
17.7 **The California Water Plan Update 2018 process will refine and advance the eight components of the Finance Planning Framework as described in the "Next Steps" section of Chapter 7, "Finance Planning Framework."**	A. IWM scope and outcomes discussed and updated (Y or N)? B. Types of IWM activities specified (Y or N)? C. Data identified, acquired, updated (Y or N)?	DWR	Partial — Existing Water Plan Program funding	No

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
Future work will cover each component of the Framework in the following ways: A. **IWM Scope and Outcomes (Component 1)** — Revisit, clarify, and adapt the scope of IWM to changing conditions and priorities. B. **IWM Activities (Component 2)** — Develop more specificity regarding the types of activities that State government should invest in with a clearer nexus to the types of anticipated benefits. C. **Existing Funding (Component 3)** — Continue to compile and synthesize data that tracks historical water-related expenditures across federal, State, and local governments in California. D. **Funding Reliability (Component 4)** — Work with the State Agency Steering Committee to identify where potential funding gaps exist between the State IWM activities described in component 2 and existing funding levels and sources. Collaborate with regional water management groups to do the same for regional and local IWM activities. E. **State Role and Partnerships (Component 5)** — Continue to clarify and elaborate on the future role of State government to support a more specific description and estimate of future costs. F. **Future Costs (Component 6)** — Estimate future funding demands by (a) launching IRWM, city, county, and special district data pull; and (b) work with State Agency Steering Committee to estimate the funding demand for existing and future IWM activities. G. **Funding, Who and How (Component 7)** — Continue to collaborate with stakeholders and federal, State, tribal and local governments to investigate and develop solutions that address the facts and findings detailed in Chapter 7, “Finance Planning Framework.” This work will	D. Method developed and deployed (Y or N)? E. Description of future role of State government advanced, made more clear or more specific? i. Local and regional survey developed and deployed? ii. Method developed and data collection? F. Finance DSS developed?		will have to be redirected from other Water Plan activities.	

Related Actions	Performance Measures	Lead Entities	Funding Status	Legislation Required (X for Yes)
include, but will not be limited to: i. Funding methods that provide a consistent financing framework for State government investments in IWM. ii. A prioritization method and rationale for apportioning IWM investment by the categories and subcategories developed in the Update 2013 Finance Planning Framework (i.e., Innovation, Infrastructure). iii. Methods for enhancing stewardship of State government monies at both statewide and regional scales, including strategies to improve the transparency and accountability of State fund disbursements. iv. Achieve the improvements described in related action #5. H. **Trade-Offs (Component 8)** — State government should develop a Decision Support System (DSS) to provide guidance and leadership for defining uncertainties of future cost, benefits, prioritization, and other tradeoffs. The DSS would inform prioritization of State government expenditures, estimation of expected IWM benefits, and methods for apportioning costs across financiers. It also includes developing a clear and consistent methodology for identifying public benefits associated with the entire range of IWM activities.				

1 **Box 8-1 Elements of the Strategic Plan**

Element	Purpose
Vision	The vision statement describes the desired future for California water resources and management, and serves as a foundation for water and flood planning during the planning horizon.
Mission	The mission statement describes the California Water Plan's unique purpose and its overarching reason for existence. The plan identifies what needs to be done and why, and how Californians will benefit from the proposed actions.
Goals	The goals are the desired outcome of the water plan over its planning horizon. The goals are founded on the statewide vision. Meeting the goals requires coordination among federal, State, tribal, and local governments and agencies.
Guiding Principles	The guiding principles describe the core values and philosophies that dictate how to achieve the vision, mission, and goals. In other words, the guiding principles describe how to make decisions and do business.
Objectives	Each objective targets what needs to be done and why, to accomplish one or more goals.
Related Actions	Related actions tell how an objective will be carried out. They describe specific actions in measurable, time-based statements of intent. They emphasize the results of actions at the end of a specific time frame. Some related actions must be undertaken by State government or communities over whom the California Department of Water Resources has no authority. In these cases, performance measures and time frames must be part of the entities' own strategic plans.
Performance Measures	Performance measures describe what to measure and the method by which to measure, to determine what work was performed and what results were achieved. Performance measures may be short term, intermediate, or long term and can help with accountability and comparisons of how well an action has met a desired goal or objective.

Source: California Department of Water Resources 2011

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Box 8-2 Update 2013 Objectives

1. Strengthen Integrated Regional Water Management Planning.
2. Use and Reuse Water More Efficiently.
3. Expand Conjunctive Management of Multiple Supplies.
4. Protect and Restore Surface Water and Groundwater Quality.
5. Practice Environmental Stewardship.
6. Improve Flood Management Using an Integrated Water Management Approach.
7. Manage the Delta to Achieve the Coequal Goals for California.
8. Prepare Prevention, Response, and Recovery Plans.
9. Reduce the Carbon Footprint of Water Systems and Water Uses.
10. Improve Data, Analysis, and Decision-Support Tools.
11. Invest in Water Technology and Science.
12. Improve Tribal/State Relations and Natural Resources Management.
13. Ensure Equitable Distribution of Benefits.
14. Protect and Enhance Public Access to the State's Waterways, Lakes, and Beaches.
15. Strengthen Alignment of Land Use Planning and Integrated Water Management.
16. Strengthen Alignment of Government Processes and Tools.
17. Improve Integrated Water Management Finance Strategy and Investments.

Box 8-3 Delta Policy on the Coequal Goals

The policy of the State of California is to achieve the following objectives that the Legislature declares are inherent in the co-equal goals for management of the Delta:

A. Manage the Delta's water and environmental resources and the water resources of the state over the long term.
B. Protect and enhance the unique cultural, recreational, and agricultural values of the California Delta as an evolving place.
C. Restore the Delta ecosystem, including its fisheries and wildlife, as the heart of a healthy estuary and wetland ecosystem.
D. Promote statewide water conservation, water use efficiency, and sustainable water use.
E. Improve water quality to protect human health and the environment consistent with achieving water quality objectives in the Delta.
F. Improve the water conveyance system and expand statewide water storage.
G. Reduce risks to people, property, and State interests in the Delta by effective emergency preparedness, appropriate land uses, and investments in flood protection.
H. Establish a new governance structure with the authority, responsibility, accountability, scientific support, and adequate and secure funding to achieve these objectives.

Source: Water Code Section 85020